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THE HORSE

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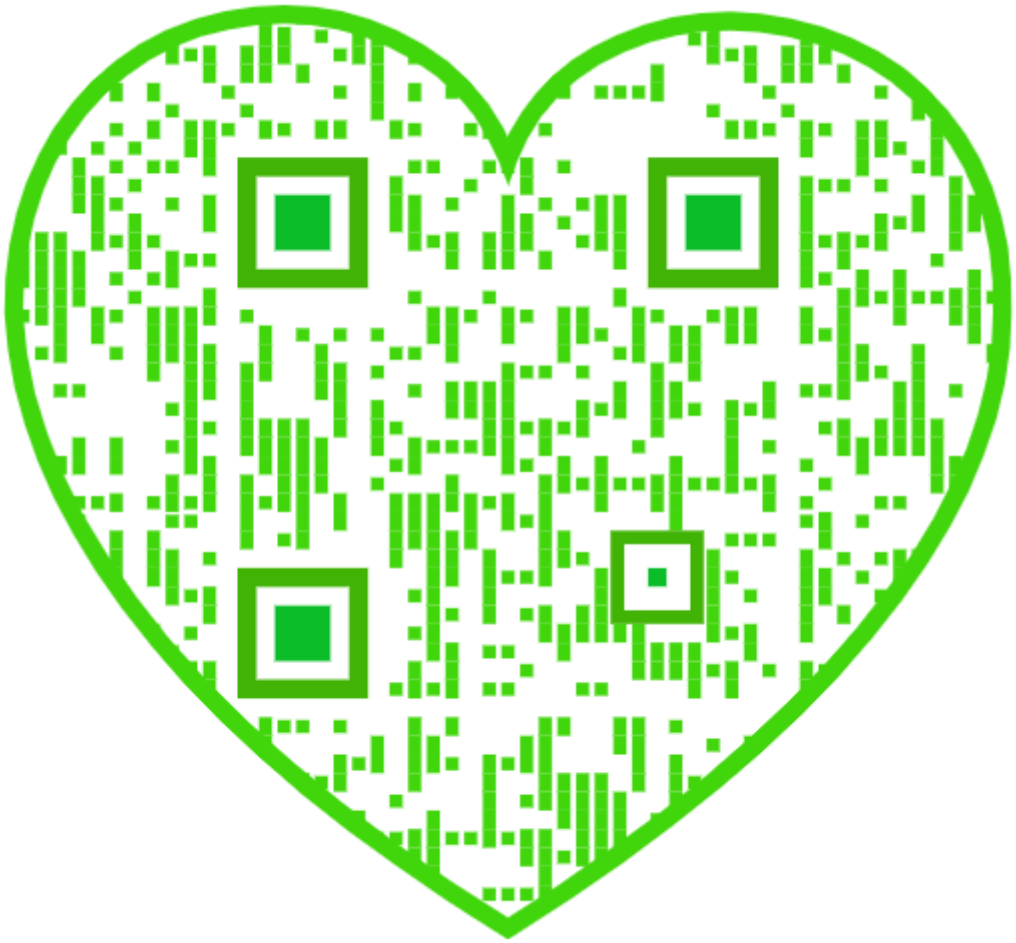

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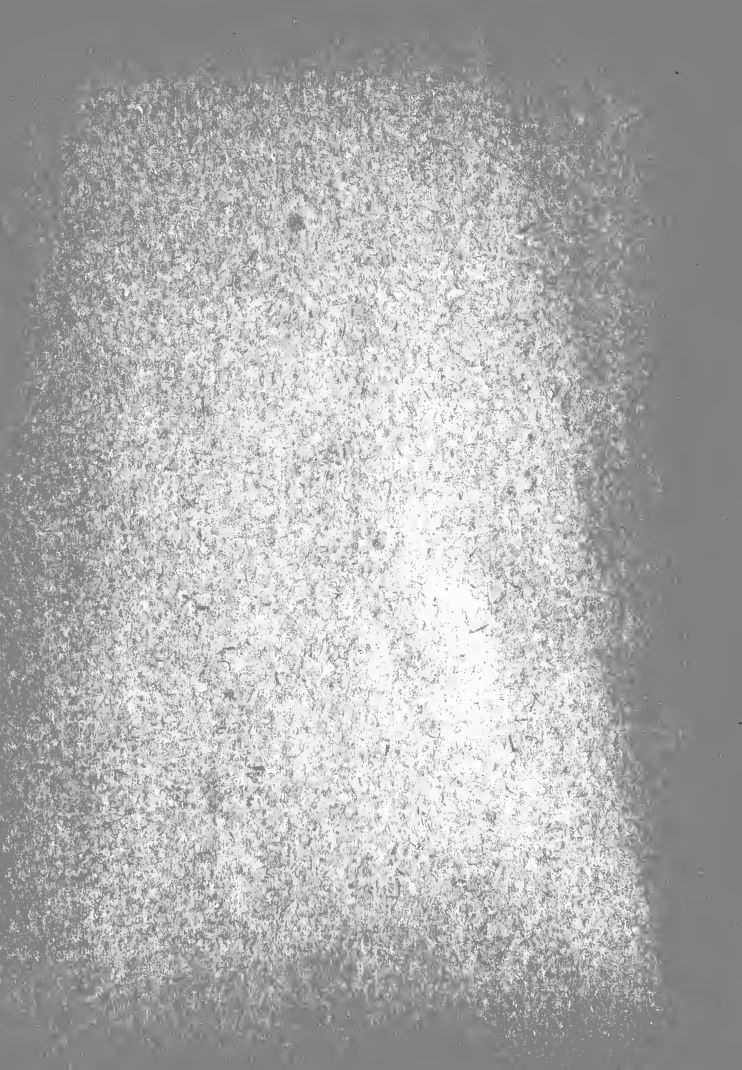

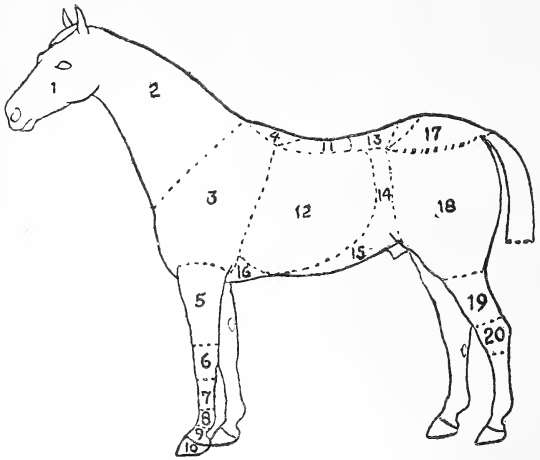

FIG. 1.—THE EXTERNAL PARTS OF THE HORSE

1. Head
2. Neck
3. Shoulder
4. Withers
5. Forearm
6. Knee
7. Shank
8. Fetlock
9. Pastern
10. Hoof
11. Back
12. Ribs
13. Loin
14. Flank
15. Belly
16. Brisket
17. Croup
18. Thigh
19. Gaskin
20. Hock

THE HORSE

And How to Care for Him

BY

C. T. DAVIES

HOW TO CHOOSE A HORSE, TELL HIS AGE, FEED, STABLE, HARNESS AND TRAIN HIM, AND KEEP HIM IN GOOD HEALTH

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THE HORSE

CHAPTER I

The Selection of a Horse

To most people the purchase of a horse is a serious and important undertaking. Any man who is interested in horses is averse to acknowledging that he knows nothing about them, and in this respect more than any other he has a great predilection for doing his own business, however incompetent he may be to do it. It is extraordinary how few people are really good judges of this animal, and how little practical knowledge men may possess in spite of much experience among different varieties of horses. To become a good judge a knowledge of anatomy is essential; but as a dissertation on anatomy is hardly within the scope of this handbook, we must confine ourselves to giving a brief description of the most desirable points of conformation for the various

classes of work, together with a few particulars of the commonest faults and unsoundnesses.

A fact which is often overlooked in connection with the purchase of a horse is that an animal may be admirably suited for one class of work and quite unsuitable and incapable for another. Thus, many horses may be "rough" and uncomfortable for riding, but will be excellent in every way as roadsters; and a horse which is capable of pulling a great weight is obviously unsuited for fast galloping. Therefore the intending purchaser must first make up his mind exactly what class of work he wants his horse for, and he must then endeavor to secure an animal with conformation such as will enable it to perform this work in the best manner and with least exertion to itself. At the two extremes are the thoroughbred and the cart horse, the former bred for speed, the latter for strength. Two greater differences could hardly be imagined in one species of animal, for the points necessary to the one are utterly condemnatory in the other; and although perhaps these differences are peculiar to the shell or external parts of the animal, rather than to the internal and vital parts, yet they are very apparent to the eye, and are the ones to which at-

tention should be paid in the choice of a horse.

The class of animal most likely to be required by the average horse-owner is the harness horse, so that in considering the various points we will keep this ideal in view. In many respects the harness horse requires the combined points of a saddle-horse and a cart horse, and, leaving out of the question exaggerated examples, such as that galloping machine the race-horse, or that equine giant the Percheron, we shall find that the bony conformation of the one differs very little, except in a minor degree, from that of the others. Such differences as exist are as a rule muscular, and as we go along we shall endeavor to indicate the various classes of work for which each variety of conformation is best suited.

Head

Although the head is very much less important from a working point of view than many other parts of the horse, yet as it is usually the first point to catch the eye, and as it is the one part from which it is possible to penetrate the secret of a horse's disposition and character, it is given priority of consideration. The chief faults of the

head are that it may be too small or too large. The reader may perhaps be surprised when we say that the head can be too small, as popular opinion is generally in favor of a small size of this part. Too small a head may indicate weak masticating muscles, and hence the owner may suffer from a bad digestion; and it may indicate small air-passages, and hence the breathing of the horse may be impaired. If, however, the small-headed horse possesses a broad, flat forehead and large open nostrils, he will not be likely to labor under either of these disadvantages, and the small head will be an advantage rather that the reverse. A large head indicates cart-horse blood, and is undesirable, because a horse is apt to carry it badly, and consequently put an undue proportion of weight on the forehand. Apart from this, however, provided the horse has plenty of bone, a big head is not particularly objectionable, and no horse need be refused because he is a little "plain."

A fairly common peculiarity is a prominence between the eyes (convexity of frontals), which is very objectionable, and generally indicates a bad temper. A small or sunken "pig" eye and a wall eye (a ring of white round the iris) are also indications of a wayward temper and ungenerous dis-

position. A wide, flat forehead and bold eye are signs of intelligence and good disposition. It must be mentioned, however, that the eye can be too big, and a "scarey," nervous horse will often possess a large, prominent eye. In this connection the ears will also be some guide, and a continuous backward and forward movement, and an endeavor to see behind, etc., may confirm suspicions that the animal is nervous. Apart from the teeth, a sunken appearance of the face, midway on a line drawn from the inner corner of the eye to the mouth, will indicate old age. The top of the head between the ears should be prominent, and the skin over the whole head in a well-bred horse should be fine and thin, showing through it the various nerves, muscles, and blood-vessels. There should be no swellings or thickness between the jaw-bones, nor should the hollows above the eyes be deep in a young horse.

Neck

The neck of a saddle-horse cannot be too long or light, nor of a cart horse too comparatively thick. The harness horse should have something between the two. A well-shaped neck, with nicely set-on head, adds much to the appearance of a

horse (Plate II. Fig. 13), and the animal will be handier and pleasanter to drive than one which is clumsily or awkwardly made. As one of the most important muscles which draws the shoulder forward runs up the neck and is attached to the top of the head, length of neck and good carriage of head mean greater power of this muscle, and hence better action. A big crest is simply an accumulation of fat on the upper part of the neck, and is chiefly an indication of fatness and not of good conformation. As it makes the horse heavier in front, *i. e.*, puts more weight on the fore legs, it is an undesirable feature. The best class of neck for a harness horse in one of medium length, slightly arched (Plate II. Fig. 13), and with well-developed muscles. A very short thick neck, which is usually accompanied by straight shoulders, is a form of conformation which, by reason of the undue amount of weight it throws forward, makes a horse extremely likely to overbalance and fall down. A horse with a "ewe" neck is often also a "star gazer" (Plate II. Fig. 9), and extremely unpleasant either to ride or drive, as not only is he liable to get the bit off the bars and into the corners of his mouth, but his carriage of head prevents him from seeing where he is stepping.

As this last is not of so much consequence in a harness horse as it is in a hunter, the fault is not such a grave one in the class of animal under consideration.

Shoulders and Withers

Whatever his work, every horse should have

Plate I.

Fig. 2. Chest too wide.

Fig. 3. Good Chest.

Fig. 4. Hocks turned in.

Fig. 5. Good Hocks.

well-sloped shoulders. Among the advantages to the animal derived from this conformation are—greater lightness of forehand, and consequently greater chance of recovery after a stumble; less "jar" to the fore legs, which have to support the whole weight of the fore part of the body; and

greater freedom of movement of the shoulders and fore legs. The shoulders should be thin and free from lumber in the saddle-horse, and exactly the opposite in the cart horse, which requires to throw a lot of weight into the collar. The two best indications of the amount of muscle carried by the shoulders are—the difference in level between the root of the neck and the shoulder, and the width between the fore legs (Plate I. Figs. 2 and 3). In the hunter or racer the neck should run into the shoulder with an almost imperceptible curve; in a cart horse the greater development of the muscles on the shoulder-blade make a very perceptible difference in the levels of the two parts, and the animal has consequently a marked "collar place." In the harness animal is required the happy medium, as the absence of a depression wherein the collar can lie is as objectionable as is a conformation too nearly approaching that of the heavy horse. The fore legs should be moderately wide apart (Plate I. Fig. 3); but when viewed from the front there should be no unnecessary muscle either on the outside of the shoulder or between the legs. The chest should be deep (Plate I. Fig. 3), not wide and shallow as it so often is in the front view (Plate I. Fig. 2).

The withers should be high, but their leanness is not so important in the harness as in the saddle-horse. They should extend far back in the direction of the tail, as this will give what riders call a "long rein." It is noticeable that hackneys, which we may regard as an essentially exaggerated type of fancy harness horse, have as a rule thick necks, somewhat loaded, but long, well laid back shoulders, and not over high withers, so presumably this conformation is necessary to, or comes as a sequence to, exaggerated action and considerable speed at the trot. The objection to loaded shoulders is minimized if they are long and sloping, and the serious drawback of straight shoulders is to some extent compensated for if the horse has a light head and neck and sloping pasterns.

Body

Every variety of horse should be fairly short in back. That is to say, the distance from the posterior termination of the withers to the prominence at the anterior part of the croup (the inner angle of the pelvis) should be short if the horse is to have the greatest power of propelling his body forward, and is to be therefore speedy. The loins should be flat and broad, so as to give room for the

attachment of muscles and to ensure plenty of space for the important organs which lie beneath them. All classes of horses should be "well ribbed up," by which term length and a backward direction of the back ribs is understood. Shortness of the back ribs is a worse fault in a saddle than in a harness horse, but it is very undesirable in any animal, as it indicates inability to "stay." In horses in hard condition a badly ribbed-up conformation will be evidenced by the "tucked up" appearance of the individual. The straighter and more parallel the lower line of the body is with the ground, the greater will be the ability of the horse to stand prolonged exertion, and a buyer should always look for a good depth of body at a line dropped vertically from the lowest part of the back (behind the withers) to behind the girth place. A good spring of ribs is essential to all horses, although flatness may be sometimes compensated for in a harness horse by extra depth.

Hind Quarters

The most successful race-horses have usually been somewhat narrow behind; but this point is not desirable in any other variety of horse. Obviously a horse which has to hold back a vehicle,

or to jump, must have powerful muscles to enable him to do his work efficiently, and one should always look for plenty of muscular development on the croup and down the quarters. Breadth between the points of the hip bones is also desirable (Plate I. Fig. 5). It must always be remembered in this connection, however, that the hind quarters must be in proportion to the fore parts, and that a horse should not be unduly developed in one part. Drooping hind quarters are unobjectionable though unsightly, in fact, this conformation is valued in Irish hunters. On the score of appearance, no doubt, a tail set on high and carried in a graceful curve well away from the body is to be preferred, although this shape has no mechanical advantage.

Fore and Hind Legs

One of the most important parts of equine conformation is the shape of the legs. Without good legs a horse will be quite unable to stand work, and, next to the feet, more attention should be paid to their shape and make than to any other part of the animal. The fore legs have chiefly to support weight; the hind legs to propel the body. Naturally, then, one must look for powerful muscles and tendons and big bones to which they

are attached. Successful modern thoroughbreds are usually leggy; that is to say, their height at the withers is greater than their length from the point of the shoulder to the buttock, and this height has been proved to be usually gained by length of leg. The cart horse, on the contrary, has short legs, consequently his length is greater than his height. As it is not a galloping machine that is wanted, but merely a well-balanced harness horse, the full-grown animal should be slightly longer than he is high at the withers, as such conformation indicates a sufficiency of strength for harness work. At the same time, the greater length over height must be due to shortness of the legs, and not to either abnormally low withers or to a long, badly coupled body. The shortness of the legs should be gained by shortness of the bones below the knees and hocks, and not by shortness of the forearms and lower thighs or gaskins, on which the muscles which move the legs are to be found. The gaskins should be as wide and long as possible, and covered with plenty of muscle, and are important parts to look at in buying a horse. The knees should be large, flat, and bony; also the hocks. The latter must be well let down (Plate II. Fig. 12), and when viewed

PLATE II.

FIG. 6. Calf Knee.

FIG. 7. Over at Knee.

FIG. 8. Splint.

FIG. 9. Ewe Neck and Straight Shoulder.

FIG. 10. Curb.

FIG. 11. Spavin.

FIG. 12. Good Hock.

FIG. 13. Good Neck and Sloping Shoulder.

from behind should be straight (Plate I. Fig. 5), and turn neither in nor out when the animal is walking. "Cow" hocks (hocks in which the points turn in—Plate I. Fig. 4) are very common in hill ponies and horses with pony blood; but beyond being unsightly they are not a serious fault, and are infinitely to be preferred to the opposite fault of hocks turned too much out. Horses which turn their hocks out give a peculiar "wrench" to the hind leg when walking. The line from the back of the leg from hock to pastern should be straight, and the front of the hock, when viewed from the side, should run almost imperceptibly down, if the hock is well let down and the bone below it large.

The same may be said of the leg below the knee. The straighter the line of the back of the leg (the absence of a "tied-in" condition below the knee), the better the leg may be considered. The leg should have great width when viewed from the side, and the tendons should be plainly visible beneath the skin in a well-bred animal. Horses sometimes stand over at the knees (Plate II. Fig. 7), and when not temporarily due to overwork, this formation is an indication of insufficient development of the large muscle on the

upper part of the forearm. It is objectionable in a saddle-horse, but of less consequence in harness. If combined with straight shoulders and with heavy forehand (shoulders, chest, neck, and head) and a tied-in condition below the knee, it is dangerous in any class of horse, as the animal will always be falling down. Horses with straight shoulders and heavy fore part are "built to fall down," and should be avoided for any class of work. Horses with "calf knees" (Plate II. Fig. 6) are very liable to strain a back tendon when putting extra weight on the fore legs, as in jumping, cantering, etc.

Long sloping pasterns, like long sloping shoulders, are important factors in the prevention of jars, and hence unsoundness. Sloping pasterns are usually an indication of speed. The discomfort to the rider of a horse with bad shoulders is minimized by long pasterns, so that it is a point which should never be dispensed with in a saddle-horse. As the harness horse has to do all his work on hard roads, and consequently is subjected to considerable shaking if the "springs" (shoulders and pasterns) are not so formed as to reduce it, long sloping pasterns should be looked for in this class also. The amount of jar caused by a horse with

straight shoulders and pasterns may be verified by any one who cares to ride successively horses with both parts long and sloping, with both parts short and straight, with straight shoulders and long sloping pasterns, and with long sloping shoulders and short, straight pasterns. Of the last three forms the verdict will be in favor of the long pasterns and straight shoulders as the least uncomfortable, and as the jar is to them so it must be to the horse, and it is impossible to lay too much stress on the importance of good pasterns in harness as well as saddle-horses. The hind pasterns are always more upright than the fore; but a condition of knuckling over is due to excessive work or to working a colt too young. In the former case it points to weakness of tendons. When viewed from the front, the pasterns should be straight, *i. e.*, the feet should turn neither in nor out. Cart horses very constantly turn their feet in, and apparently this formation, which is most obvious when going up-hill, has some advantage when moving a great weight. Short, straight pasterns are of mechanical advantage to a cart horse, and as these animals have not to travel fast there is no objection to this formation if the shoulders are long and sloping.

When looking at a horse, it is advisable to note whether he has plenty of "bone," *i. e.*, that his legs are not too small for his body, or, in another way of putting it, that he is not heavy-topped. A horse can hardly have too great a width of leg, provided it feels clean and firm to the touch. Many horses shown in excessively fat condition may appear heavy-topped, particularly stallions; but the purchaser must not allow himself to be deceived by fat, and must judge of the actual size of the body by the proportion between the size of the head, the shape of the chest, the width of the quarters, etc., and the legs. It may be added that it is almost impossible to fairly judge a very fat horse in some points, such as back ribs, as the accumulation of fat may completely hide the true shape.

Feet

Without good feet a horse is useless for any purpose. (See Chapter VIII.) Chestnut horses are reputed to have worse feet than horses of any other color; and it is notorious that the big cart horses err in this respect to a terrible extent. The outer wall of the hoof should be hard and firm and free from ridges, and should not be unduly spread.

When lifted up, the buyer should note whether the frog of the foot is well developed and free from offensive odor. A deep cleft in the frog, and an unpleasant, characteristic smell indicate thrush, and although it is rare to come across a horse entirely free from it, yet if badly developed, and the frog shriveled in appearance, the horse should be rejected. In a perfectly healthy foot the cleft of the frog is only a slight depression, and not the deep split so constantly seen. Contracted feet are less objectionable than wide-spread feet, as the former may be improved by care and attention, whereas nothing much can be done to the latter to make them permanently sound, and a horse with such feet, if put to fast road work, will be likely to develop fever in the feet, or some such complaint.

Action

Conformation makes the action. For road work, exaggerated knee and hock action is out of the question, and undesirable in every respect. At the same time, it is highly desirable that a horse should throw both fore and hind legs well forward. A long stride is obtained by good shoulder action, but it is of little advantage if the horse drags his

hind legs. At the walk and trot the marks of the hind feet should certainly cover, and perhaps overreach, the marks of the fore feet, and the more they do so, provided the animal also throws out his fore legs well from the shoulder, the more rapidly will he cover the ground with a minimum of exertion. As long as the feet are lifted high enough to clear the ground there is no advantage in knee action, and the exaggerated up-and-down knee action of some hackneys is objectionable in every way. Such horses have no pace, and they quickly hammer their legs to pieces on the road. In the ideal action of the roadster the fore and hind legs are flung well forward, the former being straightened before touching the ground, and the whole movement suggests to the eye freedom without effort.

When viewed from behind, the legs of each side should follow exactly the same course. This condition will not be attained if a horse "dishes," or goes wide behind or in front, or crosses his legs. Dishing, or the flinging outward of either or both fore feet, is very common, and although, of course, a fault, yet it is less objectionable than some if not too marked. No horse which goes wide in front is speedy, and it will generally be found that of

the two conformations, going too wide, or going too close or brushing, the animal which does the latter is the fastest. Some very fast horses go wide behind, but the peculiarity is unsightly.

One of the best tests of soundness, action, and conformation is to have the horse trotted down a fairly steep hill. By his manner of going a fair estimate of his value can at once be made.

General Appearance

A horse may have every desirable point of conformation and yet be an extremely ugly animal. When looking at horses, the purchaser should endeavor to find one which has no bad points, and if he can find it he may buy it knowing that it will be useful, and likely to last him for years, however ugly it may be. Of course, good looks in addition are desirable, but they have to be paid for at a rate far in excess of their practical value. Therefore the average individual will be fortunate if he is strong enough not to succumb to the temptation of buying an animal with some good or taking points in exaggerated degree, and also some bad ones, and confines his attention to searching for a horse which is absolutely free from any which the most critical judge could des-

ignate "bad." Every bad point is a weakness, it must be remembered, and, as such, liable at any time to cause the breakdown of the entire animal.

Age for Work

A horse is probably at his very best at six years of age. It is never wise to purchase one of less than four for moderate work, or under five for hard work. Horses which are "out of mark," *i. e.*, over eight years of age, if well formed and sound, are often likely to be more useful for hard work than younger ones. At this age, if they possess weaknesses they will, under ordinary conditions, have already broken down, so that it may be taken as a broad rule that a sound old horse is generally a good horse, and for light harness work, or work which is not too fast, there is no reason why an animal should not last until it is well into the twenties.

Blemishes and Unsoundness

The vendor of a broken-kneed horse always has a plausible tale of the exact manner in which the accident occurred, and it always *is* an accident, and never due to any fault on the part of the horse. In nine cases out of ten, however, the

cause is due to faulty conformation, and, under such circumstances, it is a certainty that the horse will fall again sooner or later, however carefully driven. Horses which are straight shouldered and heavy in front, as already remarked, should be looked at with suspicion, and if, in addition to this, they already have telltale marks, they should be carefully avoided. When a horse is well made, and has a light head and neck, the cause of the broken knees must be looked for elsewhere, and one should either suspect thrush, or that the horse had fallen from some kind of sunstroke, in both of which cases the accident is unlikely to re-occur if reasonable care is taken to avoid the unfavorable conditions. Many scars about the hocks indicate that the animal is a kicker.

There are several conditions which, although they come under the technical head of unsoundness, yet may not interfere with the working capacity of the animal. In the case of splints (Plate II. Fig. 3), for instance, the cause and position are the important factors to consider before rejecting an animal which has one. If, as is often the case, they are caused by the horse having been worked too young, and while the bones and ligaments are unfit, they will be less liable to incapacitate the

animal than if they were formed in adult life because of defective conformation. When fully formed they do not, as a rule, in themselves cause lameness. But if placed in such a position that they are likely to be hit by the other leg, or are likely to interfere with the passage of the tendons and ligaments, they may become a serious evil. Therefore, if a horse has a splint high up near the knee where it may be struck by the other leg, or far back where it may interfere with tendons and ligaments, or on both sides of the leg, which would indicate great weakness of the structures, it should be rejected.

The same may be said of curbs (Plate II. Fig. 10) and spavins (Plate II. Fig. 11). Of course, a horse with such is unsound; but if it is not lame, and its action is in no way interfered with by the defects, it may be good for many years' work, although its value as a saleable animal is much reduced by their presence.

Few horses are without a few wind-galls; but they constitute unsoundness only if they cause lameness.

Cutting, clicking, and overreaching do not come under this category, although "contraction of the hoof" should be considered an unsoundness

as are also grease, saddle-galls, and shivering, so that it is within the power of the sharp buyer to get a considerable reduction in the price of an animal with one of these complaints, on the score that it is not wholly sound.

It must always be remembered that curbs may be sprung in a moment, splints developed in a few hours, spavin thrown out in a day or two, and other defects, such as roaring, rapidly developed, so that it is possible to buy an apparently sound horse one day, and find that, through no dishonesty on the part of the vendor, he is unsound a day or two later.

CHAPTER II

How to Tell a Horse's Age

THE age of a horse is to be accurately determined only by an examination of the teeth, with a knowledge of the changes, which, from time to time, take place in them. The following directions, studied in connection with the accompanying diagrams of the lower jaw, will enable any one of ordinary acuteness and powers of observation to judge for himself, and thus to avoid that most common of all the dealer's impositions, a liability to be deceived in the age of horses held for sale.

The incisors furnish the chief indications; and to them the attention must be mostly directed; but the back and hook teeth should be observed to some extent, as their condition may occasionally serve to correct and more frequently to corroborate the indication of the incisors.

When first foaled, the colt has no incisors.

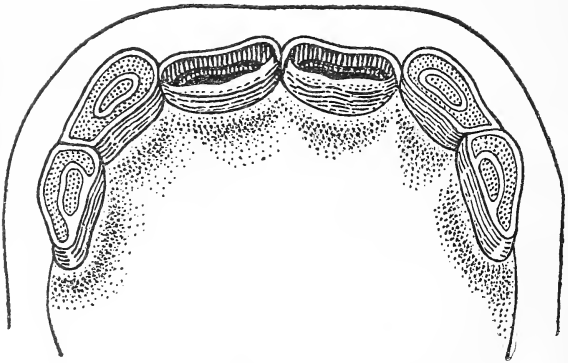

FIG. 14.—Lower jaw at two and a half years.

Twelve back teeth have in most cases forced their points by this time through the gums; but it is not until from two or three months afterward that the four nippers appear; in six weeks the nippers are seen; and in about eight months the four corner teeth. There are now, at eight or nine months old, twenty-four teeth (upper and lower), called foal-teeth. These are all changed by the fifth or sixth year, and those that follow are called horse-teeth.

The back teeth appear as follows: the three front double pair are seen at birth, and are afterward changed; the fourth double pair appear from the eighth to the ninth month (this fourth double pair are the first that remain stationary, and they are found in every year-old colt); the fifth double pair, or fifth four, appear in the second or third year; the sixth usually in the fourth or early in the fifth year. These three double pairs of back teeth (last named) remain unchanged, as do also the four hook teeth.

The hook teeth are uncertain as to appearance, coming sometimes at the end of the third year, sometimes in the middle or at the end of the fourth, sometimes in the middle or at the end of the fifth, sometimes at the beginning of the sixth.

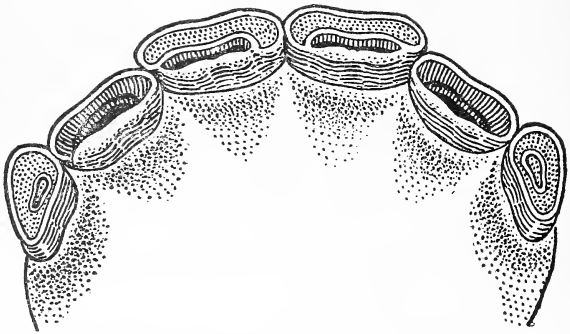

FIG. 15.—Lower jaw at three and a half years.

Observe particularly that the incisors of the foal differ from those of the horse (1) by their regular, conical formation; (2) by a narrow contraction called the neck, visible almost in the centre of the body of each tooth, while nothing of the kind is seen in horse-teeth; (3) by their smaller size, even when full grown. The milk teeth (or those teeth which are cast or shed), taken from the jaws of dead foals and compared with horse-teeth similarly obtained, are found to be only about half as long as the latter. The breadth is not to be depended on, since the milk teeth of larger foals appear almost as broad as those of small horses. When the nippers become horse-teeth, they form a great contrast to the middle and corner teeth. The size of these last will at once show them to be milk teeth. (4) By the fact that the outer surface of the foal-teeth is smooth and striped with brown, while on horse-teeth the same surface is divided by a dirty yellow indentation inclining toward the centre, which is sometimes double upon the upper teeth.

One should study the form of the incisors by carefully examining those taken from dead horses of different ages. Each incisor will be found to consist of a hard, enameled part, called the grinder,

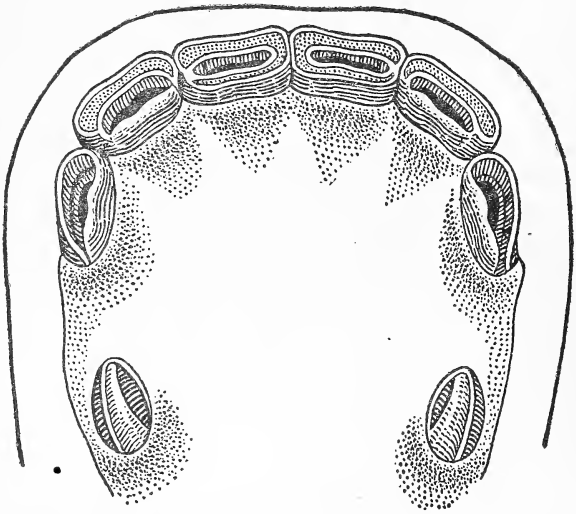

FIG. 16.—Lower jaw at four and a half years.

which has protruded above the gum; of a bony substance, which has been for the most part hidden in the gum; and of a root, which has occupied the cavity of the jaw-bone.

These teeth (of the foal as well as of the horse) are slowly but continually worn away by biting and chewing, so that the length is constantly decreasing,—sometimes evenly and regularly,—so that in old age the tooth that was once two and a half inches long is found to be not exceeding half an inch in length. The breadth generally decreases in about the same proportion; but with this difference in foal and horse-teeth, that the thickness and breadth of the foal-teeth are constantly decreasing from the grinder or hard enameled part to the end of the root, while horse-teeth decrease from the root upward. The grinder, or hard, grating portion of the tooth, which has not yet been used, has somewhat the form of an egg; it is three times as broad as thick, and hollowed out in the shape of a funnel, which hollow has two sharp edges inclosing it. This socket or hollow is called the *mark*. In the centre of this mark, a sort of kernel may be seen—a tube commencing at the end of the root—that contains the nerves of the tooth; but this inner hole must always be dis-

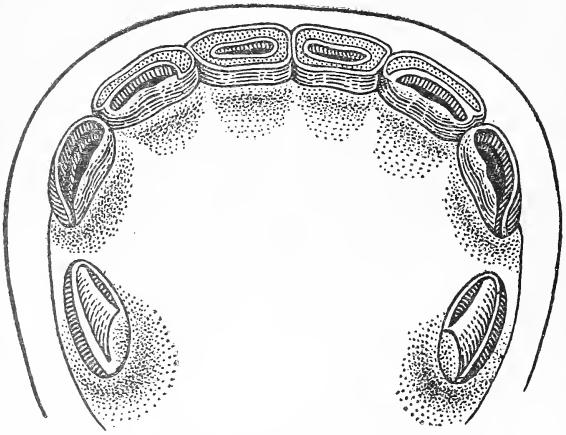

FIG. 17.—Lower jaw at five years.

tinguished from the mark, which is the outer depression, lying next to the sharp edges. The inner cavity is a funnel-shaped socket, of hard, enamel shell, around which, and inside the outward shell, is a thick fluid, which remains during the life of the tooth, becoming, by degrees, gray matter. This fluid averages about four lines in depth in the lower incisors and about eight in the upper ones.

The outer edge of each incisor always rises a line or two above the inner edge; therefore, when the upper and lower are first grated together, only the outer edges touch for some time; and the inner edges do not touch until the outer ones are worn down to an equal height with them. Horse-teeth generally do this in about one year. At the age of two and a half, the teeth begin to change, and those which then appear are called horse-teeth.

A full-grown stallion or gelding has forty, and a mare thirty-six teeth—the male having four hook-teeth which are lacking in the female, except that sometimes she has imperfect teeth in the corresponding part of the mouth. Those teeth found in some young horses, next to the first double teeth, and called "wolf teeth," are not included in this number, as they are not real teeth,—frequently

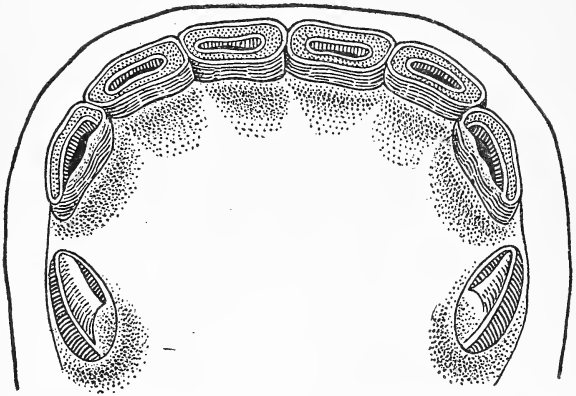

FIG. 18.—Lower jaw at six years.

not breaking through the gums at all, and usually, in any case, disappearing in eight or nine years. Twenty-four of the true teeth, in both horses and mares, are situated in the upper part of the mouth (that is, in both jaws, *above the lips*). They are divided into six double pairs, counting upward from below, so that those situated next to the incisors in all the four rows are first; those next to them, second; and so on to the last pair, which are called the back teeth.

Twelve others are in the lower part of the mouth, surrounded by the lips, six in the upper and six in the lower jaw, standing, each lot, in the form of an arch, and occupying the entrance to the hollow of the mouth. These twelve are called incisors. The four innermost, two in each jaw—these forming the key of each arch—are called nippers; the other two in each arch are called the corner teeth, and those between the nippers and the corner teeth are called middle teeth. Each of these teeth in the lower jaw rubs against the corresponding one in the upper jaw. The teeth of the upper jaw are broader and thicker than those of the lower. The four hooks are seated alone, over each corner tooth, but nearer to the corner teeth of the upper than those of the lower, so that

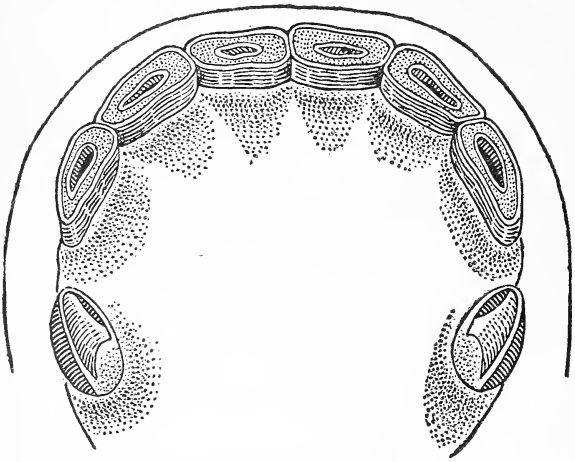

FIG. 19.—Lower jaw at seven years.

they (the hooks) never come in contact with each other.

The horse has always attained the age of four and a half or five years before he has a full number of perfect teeth. Before this time, the younger the animal the fewer the teeth, and even these are not all permanent.

The more a permanent incisor loses in length, by friction, the more it also loses in width, so that the nearer the friction surface approaches to the root, the narrower and thicker it must appear.

Every new hook tooth is cylindrical and somewhat hooked, with a cone-shaped projecting grinder, and this is surrounded by a spoon-shaped edge, turned toward the hollow of the mouth, so that the cone cannot be seen from the outside; and the whole grinder, or hard, enameled part, has the appearance of the back part of the bowl of a spoon—the edge, like a screen, surrounding the short cone, but so that two deep furrows remain between. Except this grinder, the rest of the body is uniformly round and the surface almost even. As previously said, however, these by themselves afford no reliable indication as to age.

Large horses have, of course, larger teeth than small ones; but taking a horse of medium size as

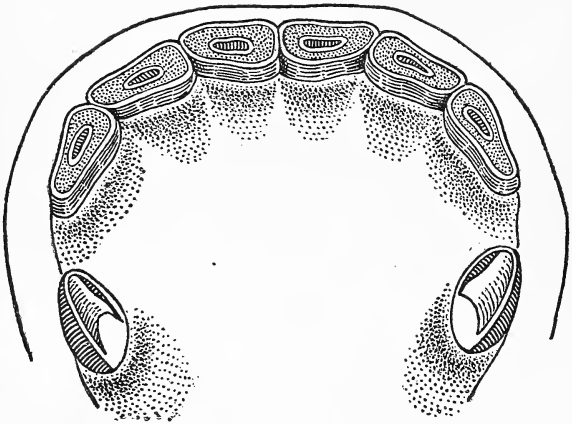

FIG. 20.--Lower jaw at eight years.

a standard, one can make allowances for either larger or smaller, and easily arrive at just conclusions.

The incisors being our main reliance, our remarks must be understood to refer chiefly to them. The length of the tooth of a horse of medium size is three inches, or thirty-six lines. After the changed tooth has arrived at its proper length, it shoots up a line regularly every year, and if the teeth stand right, the grinder is worn off a line every year. It is also, as has been said, worn off in both width and breadth, so that the grinder becomes, from year to year, shorter and smaller, as shown by the chart.

If, however, the teeth stand too far forward (irregular teeth) they do not wear down in the same proportion as they shoot upward, and they become very long. The age in this case can be ascertained with ease and exactness by observing with care the following points: At the age of five years, the corner teeth of the lower jaw have grown up five lines above the gum; each middle tooth, seven lines; and each upper, nine. At eight years, and older, each corner tooth of the same horse projects only four, the middle, six, and the nippers, eight lines above the gums. This is

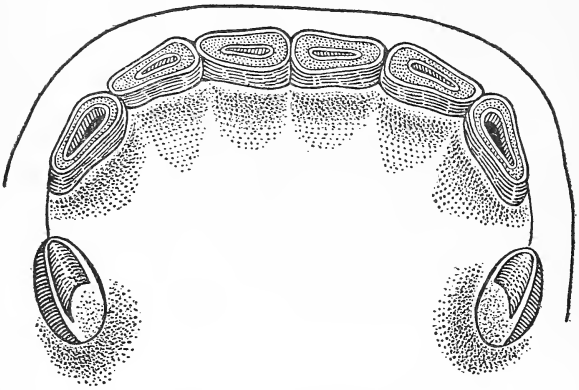

FIG. 21.—Lower jaw at nine years.

absolutely necessary to be taken into account, because it is the only means by which one can decide with certainty as to the age of a horse whose teeth have become longer than they would have been if set right and wearing regularly.

The foregoing remarks and directions are based upon the assumption that there is no peculiarity about the individual animal or the breed to which he belongs that would materially interfere with the principles laid down. It remains, however, to notice that to those breeds of horses which develop very slowly, of which the Spanish horse may be cited as an example, the rules are a little more difficult of application. The bones of these, and perhaps of some few other kinds, seem to be harder, and the teeth change somewhat later and appear to wear down more slowly ; so that it sometimes happens that such horses, after their fifth year, appear a year or two younger than they really are ; but the same animals are apt to be more than ordinarily strong, hardy, and long-lived, and to be taken at a diminished age really detracts nothing from their worth.

The age of a mule is somewhat difficult to determine with exactness, owing to the cause just stated.

Deceptions may be practiced with very thrifty

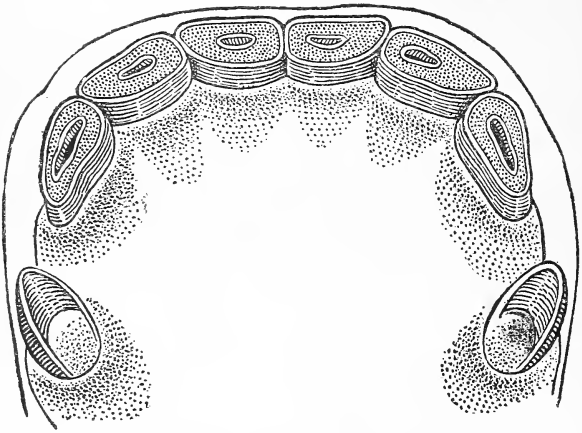

FIG. 22.—Lower jaw at ten years.

young horses, when it is desirable to make them appear of suitable age for work or for breeding, by knocking out the incisors a year sooner than they would naturally change themselves. If a purchaser suspects deception, he can determine the matter by closely examining the remaining teeth. If the nippers have changed, and the inner edges of the corner teeth have not yet come into contact, the foal is but one year old—and so on.

The opposite cheat—that of trying to make a horse appear younger than he really is by burning artificial marks in upon the teeth—can be detected by closely examining the enamel and the effect of the mark upon it. When a horse has reached an advanced age, say twelve to twenty, the enameled surface has become so minute that burning in as large a mark as is found in horses considerably younger would disturb the whole enamel and so leave a means of detecting the fraud.

In the case of crib-biters, that wear out their teeth prematurely, and so appear really older than they are, examination must be directed to the corner teeth, which are seldom injured ; or, if the corner teeth prove to be injured, deduct from the apparent age as many lines as are wanting to make the teeth of the natural length. To feed con-

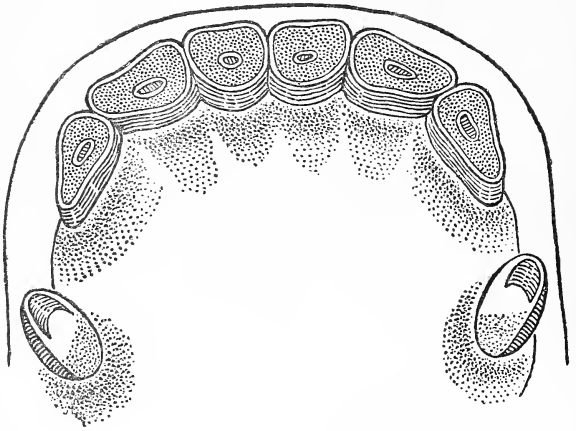

FIG. 23.—Lower jaw at twelve years.

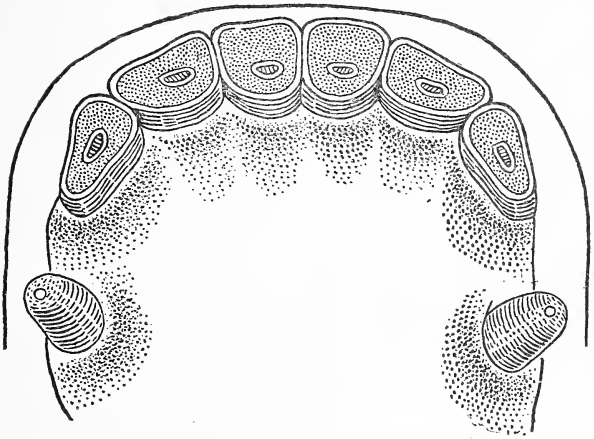

FIG. 24.—Lower jaw at fifteen years.

stantly, from weaning time, upon hard, unshelled corn, sometimes produces the same effect as crib-biting, and the same directions must be followed in forming an estimate.

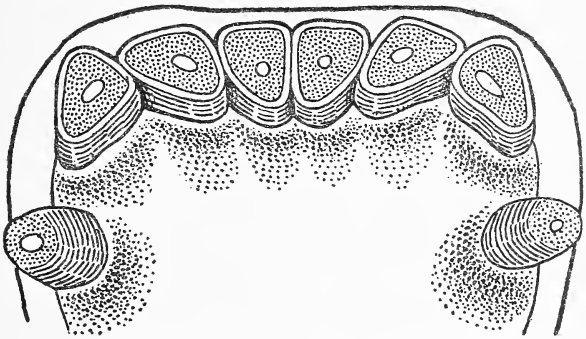

FIG. 25.—Lower jaw at twenty years.

CHAPTER III

Sound and Unsound Horses

So much importance is attached to what is technically called soundness in a horse, and the value of an animal is so remarkably depreciated if it fails to come up to the somewhat high standard expected by the average buyer, that a chapter devoted to the subject may not be out of place.

First of all, unsoundness is usually defined as the disease or alteration of structure, which renders, or will render, a horse less capable of performing the work required of it. This definition is not very satisfactory, however, because, as we shall show, many horses are technically unsound, yet are perfectly capable of doing all the work required of them for a great number of years. It is possible that too much stress is sometimes laid upon soundness. For instance, a case may be cited in which the buyers of a cob insisted upon absolute soundness, and rejected a number of useful, mature animals, each of which was tech-

nically unsound in some respect; yet they eventually bought a pony which was passed as absolutely sound in wind, limb, and eye, but which gave them endless trouble and expense owing to a weak and disordered digestion.

Owing to the iron shoes, the hard roads, the rapid and continuous trotting, and the heavy loads which have to be moved, inflammation is constantly set up in the bones, tendons, or ligaments of the legs. When one considers the unnatural conditions under which horses labor, the wonder is, perhaps, that any ever reach maturity without some abnormal condition as the result of "work." It is those points of conformation which centuries of experience have proved to man to be best able to stand work, which are the ones sought for by horse-owners, and a well-shaped hock, say, is literally one which is put together in such a way as to be able to stand unaltered the malign influences of violent concussions and sudden strains.

A curious corroboration of the beneficial result of the continual selection of horses with certain points for work has of recent years come to light. In South Africa an endeavor has been made to utilize zebras for harness purposes, but the serious attempt had soon to be abandoned, as they were

found to be much too "soft." Zebra hybrids, of which at one time such great things were expected, have also proved to be unfitted for very hard work, and there can be no doubt that the wild horses, originally domesticated by our remote ancestors, were as little adapted for hard labor as their wild relatives are at the present day. A comparison of the hocks of the wild and tame Equidæ will reveal the differences brought about by artificial selection.

Veterinary Examination

If the prospective buyer has submitted a horse to a veterinary examination and it is passed as sound, he usually considers that he has done all that is necessary, and is bound to have a good animal. It must be pointed out, however, that a certificate of soundness is far from representing an animal's true worth. Presuming that the veterinary surgeon is well up in his duties, and is also a good judge of a horse—two qualifications not always obtainable in every country practitioner—it is yet only his duty to say whether or not a horse is sound at the time it comes under his notice. This is what he is paid to do, and a veterinary surgeon would be exceeding his duties,

and also the professional etiquette of his attitude toward the seller, if he was to volunteer an opinion as to the quality of the horse or its suitability for any special purpose. Therefore a buyer can, and must, only legitimately expect to be informed whether a horse is technically sound, and herein, no doubt, lies the pitfall into which a great number of people, who know very little about horses, stumble.

The usual form of veterinary certificate sets out a description of the animal, and possibly mentions either that, owing to some specified defect, the animal is, in the opinion of the writer, unsound, or else that it has certain minor defects, such as a splint, cracked heels, etc., but is otherwise, in the opinion of the writer, sound.

A horse may have minor defects such as the above-mentioned, yet if he is not lame, and the defect does not seem to detract from his natural movement, he is, *at the moment*, sound. It is not the veterinary surgeon's duty, even if he could tell (which is unlikely, unless he has had an intimate previous acquaintance with the horse), to say whether the temporary defect is likely to get worse and incapacitate it from work a few days or weeks later. Thus the value of the

examination is, comparatively speaking, *nil*, unless the would-be buyer is sufficiently up in veterinary matters to be able to put an exact value on the information gained, in which case he would probably not require the services of a veterinary surgeon at all.

Then, again, a horse may be passed as absolutely sound, and may be so at the time, yet he may have hocks so badly shaped that it is obvious to the initiated that he will be likely to spring a curb if hunted, or even if put to certain sorts of carting work. Or he may have the combination of a heavy body, and hoofs which almost certainly suggest laminitis; he may even have only recently come up from a long run at grass, necessitated by this or some other disease, yet the veterinary surgeon can only say that the horse, as brought before him, is sound. It is not his duty to take a pessimistic view, to point out weak points of conformation, or to prognosticate possible disaster in the future. Thus we reiterate that the value of a veterinary certificate of soundness is small compared to the value of certain points of conformation in the horse, and that to have the animal passed as sound does not exempt the buyer from the necessity of exercising or obtaining skilled ad-

vice on the general make and shape and suitability of the animal to perform a certain class of work without breaking down.

Again, if the horse is passed as unsound because of certain specified defects, the buyer who depends solely upon the certificate must perforce reject it, and may at the same time lose the very animal which would have suited him. As stated earlier in this book, a horse with a technical unsoundness is not necessarily unfit for moderate, and even hard work, and it is only by a knowledge of the cause and character of the complaint that a fair estimate can be made of the animal's value. A certificate setting forth that the horse is unsound is, of course, of inestimable value to the knowing man who is not afraid, under certain conditions, to buy at a reduced price. His knowledge may tell him that the horse is equal to performing all his work quite as well as a more expensive and technically sound one. We intend to deal more explicitly with the various common unsoundnesses, and to show the values which must be placed upon them with reference to the different classes of work: it is hoped that to start with we have made clear to the uninitiated that a sound horse is not necessarily either a good or useful one, and have drawn

attention to the fact that a certificate of soundness does not invariably qualify a horse as a desirable acquisition for the stable.

Sometimes a horse is too sound for its age. By this somewhat paradoxical statement we mean to imply that an animal of, say, seven or eight years old, which shows no work, is an object of suspicion. Few horses can do a fair three or four years' work without showing wind-galls, if nothing worse, and an entire absence of these concussion-indicators suggests that the horse has been kept in cotton-wool, and has for some reason or other never earned his keep. As people do not usually keep horses to look at, the inference is obvious. The only exception to this rule is in the case of mares which are known to have been kept for breeding. For a reason which does not affect their working capacity, they may have had to be drafted out of the stud, and they may then be as fresh on their legs as colts when they come into the worker's hands at a mature age.

Curb

(See Fig. 26.) Curb is a swelling at the back of, and a few inches below, the point of the hock. It can only be seen when the observer is standing

a short distance off, to one side of the horse, and square with the suspected leg. As the accompanying diagram will show, the horse's hock is composed of a number of bones (usually six), and a broad ligament, not shown in the diagram, fills

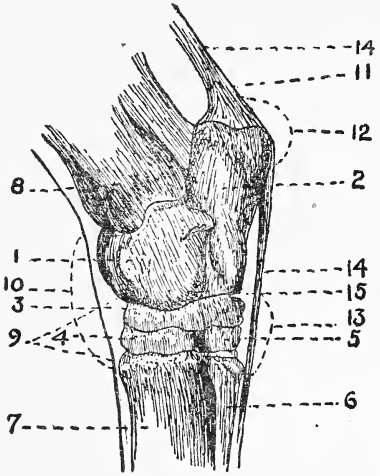

FIG. 26.—Diagram of the Inner Side of the Off Hock.

1, astragalus; 2, os calcis; 3, large cuneiform; 4, median cuneiform; 5, small cuneiform; 6, splint bone; 7, cannon bone; 8, tibia; 9, position of bone spavin; 10, seat of bog spavin; 11, seat of thoroughpin; 12, capped hock; 13. seat of curb; 14, perforatus tendon; 15, space filled by ligament, injury to which causes curb.

the space from the point of the hock between the bones and the perforatus tendon. This ligament is bound by fibres to the edges of the small bones, and acts, in conjunction with other parts, as a lever to aid in propelling the horse forward. Now, in certain cases the fibrous ligament may be torn away from its attachments, or otherwise unduly strained or stretched, with the result that the subsequent disorganization will lead to a swelling which will be broadly called a curb.

A simple sprain or twist of the ligament may give rise to a curb, but our best modern authorities are more of opinion that the most frequent accident is an actual tearing away of the fibres from some of their attachments. The consequent inflammation leads to an abnormal thickening and partial ossification at the seat of the injury; hence at the point where the ligaments are torn away from their contact with the bones, a lump will form which will, by pushing out the adjacent structures, cause a curb of greater or lesser dimensions, according to the extent of the injury. Thus a curb may be briefly defined as a thickening or other abnormal condition of the ligament due to its injury. As a rule, the tearing away is insufficient to cause an actual displacement of the

small bones themselves; but in cases of serious injury, the cuboid bone may actually get out of its normal position, may press the ligamentous brace outwards, and in this way cause a bad curb. Again, the seat of injury may be the head of the splint bone, or the cannon bone, in which case enlargements (not technically called curbs) will appear in corresponding positions.

It is obvious that to cause a serious injury to structure such as have been described a horse must either have been put to an unduly severe strain, or, if this is out of the question, must have hocks of a shape and constitution which predispose him to throw out a curb with very little provocation.

We have already mentioned that it is necessary to stand square to a horse's hind leg to judge whether it has a curb. On no point, perhaps, in equine conformation does so great a diversity of opinion exist as to the presence or absence of this unsoundness. Some horses have what are called "curby" hocks, that is, hocks which are not well let down, and which have very prominent heads to the splint bones. From any other point of view but the orthodox one, they are often mistaken for curbs, owing to their "lumpy" appear-

ance. The feel with the hand should decide the matter, because, if the appearance be due to peculiar conformation, and not to a pathological condition, the course of the back tendons will be straight. A horse does not very often have curbs on both legs, so that great suspicion should be aroused if one hock differs in appearance from the other. If there are, indeed, curbs on both legs, the animal should be unhesitatingly rejected as quite unfit for any but the lightest work.

Having decided that a horse has a curb, the next point is to endeavor to find out its exact nature, and when and how it was acquired. Obviously, if the curb is of recent origin there will be inflammation, and the horse will be more or less lame from the pain, and inclined to rest the leg. In this state a horse should never be bought with the expectation that he will be shortly fit to work again. The active mischief will take weeks to repair, and the horse will afterward need at least a six weeks' run at grass, with blistering and perhaps firing.

A moribund curb, however, is quite another matter, and a horse with the disfigurement may, under certain conditions to be named hereafter, be almost as good as ever he was, and quite worth

buying for some classes of work. The first point of importance is to ascertain whether the hocks are naturally of good shape. If they are, it is fairly safe to assume that the unsoundness must have been caused either when the horse was very young, or else by some unusual and extraordinary strain.

Curbs are sprung in a moment, just as the ankle in the human being may be sprained during a game, or even when walking. Hunters constantly injure themselves suddenly when jumping; but if their hocks are well shaped, and they are over the period of active trouble, there is no reason why they should not perform harness work soundly for the rest of their natural lives, although it might be wise not to hunt them again. For example a cob, as a three-year-old, threw out a curb on the near hind leg, owing to being ridden by a man too heavy for it at that early age. Once the active mischief ceased, the working ability of that pony was in no way impaired, and it was still going soundly and well in its daily work many years later. If the history of a curb can be ascertained, and its origin can be proved to date back to a time when the horse was either immature or was being hunted, then it would be fairly safe to buy the

animal for harness work. A horse bought cheaply because of some defect must, of course, always be something in the nature of a gamble, but in the case of the particular unsoundness in question, it is safe to assert that once the inflammatory condition is dead, and the injured ligaments have assumed their abnormal shape or position, the matter is at an end, and the horse capable of ordinary work. The worst to be feared is that the horse may periodically go lame in the leg owing to rheumatism in the altered structure; but this is not of common occurrence, although lameness in a leg with a long-standing curb, unaccompanied by heat, may perhaps be traced to something of a rheumatic nature.

Apparently sound horses which rest a hind leg (or indeed any leg) at every opportunity should not be purchased. If a horse is very tired after a day's hunting or a long journey he often rests his leg, but it will then be seen that he changes frequently from one to the other, and favors neither. He may also legitimately, when in his stable and tired, point one fore and the opposite hind foot, resting his nose meanwhile in the manger, in which attitude he apparently goes to sleep. He should not, however, habitually rest a certain leg

whenever opportunity occurs, in harness or otherwise, and if he does so it is a sure indication that there is a sense of discomfort, which will probably ultimately manifest itself.

The older the damage the less knob-like and the more diffuse and spread-out is a curb, so that from its shape alone it is possible for the expert to estimate whether it is of long standing.

It is possible, of course, for a horse to get a swelling in the position of a curb from kicking in harness, or from a blow. When a buyer is assured that the defect is due to some such cause, it is extremely difficult for him to prove to his own satisfaction that the injury is in reality incipient curb; at the same time, the latter is deep-seated, and feels quite different to the superficial swelling of a bruise.

Curb is an unsoundness which is as difficult to hide from the initiated as broken knees, hence it is waste of time to try and make a cure which leaves no telltale scar. In very bad cases the primitive method of firing proves efficacious, because the burning of the skin causes it to contract and hence act as a more or less efficient brace to the weakened part. In slight cases, when heat and lameness are the only indications that some-

thing is wrong, a blister composed of biniodide of mercury, one part; lard, four parts, should be immediately well rubbed in. The horse must have absolute rest and a light diet, and should be fit for work again when the effects of the blister have worn off.

Spavin

(See Fig. 26.) This complaint must not be confused with bog spavin, to which it is not even remotely allied. Bone spavin, as we will call it to avoid confusion, is extremely common in some districts, and is much more prevalent in some breeds of horses than others. Actually it may be defined as a bony enlargement found on the inside and lower part of the hock, due to disease.

To understand the exact nature of bone spavin, we must return to a study of the horse's hock. As already mentioned, it is usually composed of six bones, sometimes of seven, according to whether certain of the bones are naturally fused together, or separate, or altogether absent. As evolutionists are well aware, the horse is descended from a five-toed ancestor, and the two splint bones are rudiments of two additional toes. As evolutionary changes are always much retarded, if not en-

tirely suppressed, under domestication, we find that horses are subject to a certain amount of variation in the number of bones which go to make the hock joint, and these differences no doubt have a certain effect on the capabilities of the individual. The tendency is, of course, for the number of bones to diminish in correspondence with the loss of the toes with which they were once articulated, but owing to reversion some horses possess additional rudimentary bones in the hock which are of no use, and should not actually be there. It is probably this variation, and the consequent instability of the joint, which indirectly causes horses to be so predisposed to spavin and other bone diseases in this region. It will be seen, on reference to the diagram of the hock, that there is normally on its inner side a column of bones composed of the astragalus, large cuneiform, and median cuneiform, which rest on the metacarpal or cannon bone. Owing to jar, strain, or work, the bones become inflamed, usually between the metatarsal and median cuneiform, or between this and the large cuneiform. Inflammation of bone, its covering membrane, and its articular cartilages, always leads to abnormal liney deposits at the seat of inflammation, hence the result

of disorganization of this region is a bony enlargement, which is called by horse-owners spavin.

In the case in question the inflamed bones are ultimately fused together by the deposit which results from the inflammation, so that instead of the front of the hock being composed of a column of separate bones, each of which plays comparatively freely over the others and feels smooth to the touch, it becomes fused into a rough, unsightly mass. The seriousness of spavin depends largely upon the extent and position of this fusion. If only the cannon bone and median cuneiform are involved, or even if fusion extends to the large cuneiform also, the horse will be unsound, of course, but not necessarily much the worse. But if fusion extends higher up, between the large cuneiform and astragalus, the horse will be unable to bend his hocks properly, and his capacity for work will be very materially depreciated thereby. Also the more to the front the fusion is, the more serious it is. Therefore the seriousness or otherwise of spavin depends mainly upon its extent and position, which are easily ascertained by feeling for the rough bony deposit with the fingers, and by noting the manner in which the horse bends his hocks. A horse which cannot

back freely, in conjunction with other suspicious indications, is probably suffering from hock trouble.

As in the case of curb, a horse is usually only lame from spavin when the inflammation is active, and the bony enlargement actually in process of formation. Unlike curb, however, the hind action can never be quite the same again, however slight the disease, because of the hindrance to the perfect freedom of movement which inevitably takes place. As already stated, the lower down the disease, the less is the horse's action affected; thus a lot of work might be got out of a horse with slight spavin if the inflammation is no longer active. It must always be remembered that spavin is perhaps a natural evolutionary tendency toward a union of the bones of the hock, and that a hock which is weakly formed will almost inevitably become more badly diseased if the animal has to carry heavy weights, pull heavy loads up hills, or perform work which will create compression or severe strain on this part. Therefore only a horse which moves well and soundly, and has well-shaped hocks, should be considered—at a price—if it has a moribund spavin low down and to one side of the leg. An animal in which the action is

affected, which has a considerable development of the disease, and the shape of the hocks of which are not quite satisfactory, should be avoided by any one who hopes to have a horse capable of doing regular work of an exacting nature.

The treatment of spavin, when a horse shows by lameness and heat that he is developing the disease, consists in endeavoring to hasten the union of the bony surfaces. Unlike curb, the disease comes on slowly and insidiously, and may be checked by blistering and firing, if taken in time. It must not be expected, however, that a perfect cure, leaving no trace, can ever be effected. In young horses complete rest—which, indeed, is essential at all ages—and a blister, may check the evil before serious mischief is done, so that nothing but a poor hind action and some ridge-like marks across the front of the joint, which may escape the notice of an unobservant person, will be left to tell the tale of past trouble.

Hock Lameness

A horse may sometimes be suspiciously stiff in his hind action, may even be lame in the hock, and yet have neither heat nor exostosis. Many people have been puzzled by cases of this nature,

and have at length been obliged to discard the horse for a lameness which, as there is no outward indication of trouble, it was impossible to cure. As a horse should not be bought if it is actually lame, it is unnecessary to enter into the details of this stage of the complaint, but the probable cause of an unnaturally stiff movement when no spavin is visible will be of value to the reader. As already shown, the hock is normally composed of a number of small bones, which are naturally lubricated by a secretion called synovia, which enables them to play freely over one another. It is possible for a jar or severe strain to set up inflammation and ultimate bony union between the inner edges of the adjacent bones, or actually between the upper and lower surfaces of any of the superimposed bones. Disease which is deep-seated like this will obviously be undiscoverable to eye or hand, and, once the active stage is past, nothing will be left but a stiffness of gait, which will be apparent to any one acquainted with the correct way in which a horse should move. It is not safe to trust to the actual footmarks made by a horse to decide whether he is bending his hocks in the way he should, because some horses learn to counteract the disability left by hock disease by

moving their legs forward from the hip in a rather peculiar way, and thus more than cover with their hind foot the print left by the front one. It can only be repeated that hocks which are not bent are often diseased, and that it is possible for the unsoundness to be in such a position that it is absolutely undiscoverable. In these cases, a veterinary surgeon of course passes the horse as sound, provided it is not actually lame at the time he sees it.

It is impossible to say whether horses with occult spavin, as it has been called, should be purchased or refused. Much depends upon the actual case; but it is strongly recommended that where this disease is suspected, a few days' trial prior to purchase should be absolutely insisted upon as a preliminary condition. If this is not allowed, refuse the horse at any price. In an obscure complaint of this nature, with no surface indication, it is, of course, impossible to tell whether the disease is active or is of long standing, and it is upon the elucidation of this point that the advisability of purchase depends. If the hock is slightly inflamed, a hard day's work will result in lameness next day; if the inflammatory stage is long since past, the horse will be but little

stiffer in his gait after work than he was before. Therefore it is essential that he be under the entire control, and in the stable, of the would-be purchaser for at least a couple of days, so that he can be submitted to a thorough test, and so that his habits, *i. e.*, predisposition to rest the leg at or after work, etc., can be observed. If he comes out of the ordeal none the worse, then he is probably worth buying at a price commensurate with his poor hind action. It should be added that a thirty-mile drive will fairly test a horse for most of the common unsoundnesses of the legs.

Another Mysterious Complaint

When a very taking horse is offered to one at a very reasonable price, the natural conclusion to come to is that something is wrong with it. If, on examination, it proves to be free from splints, spavins, curbs, wind-trouble, and all the common and obvious unsoundnesses, one is rather at a loss to discover what is the matter. A case of this sort came to notice not long ago. The pony was a model. It was apparently sound, quiet, and desirable in every respect, and yet the prospective purchaser was convinced that all was not right with it. The owner was persuaded to leave it on

trial, payment of a definite sum for hire to be made if it was not ultimately purchased. Driving revealed the fact that the pony had a tendency to "drop" one hind leg occasionally in the course of a drive. Not only this, but it rested the leg much in the stable, and, furthermore, evinced a tendency to shivering in that thigh. Eventually it was found possible to cause slight pain by pressure on a certain part of the thigh, and the ultimate conclusion come to was that the pony was suffering from some disorder which affected the sciatic nerve. A sudden twinge of pain, which it apparently felt occasionally, no doubt caused the sudden drop of the leg, which was dangerous, as it always occurred going down-hill.

The above incident is submitted, partly to show how difficult it may be to detect certain classes of disease, and also to emphasize the great benefit of always having a horse in one's own stable for at least a day or two before buying it. If a seller strongly objects to allow a trial to a responsible person, his prejudices may be overcome by the offer of the payment of a reasonable sum, per week, if no sale takes place. If he refuses any such arrangement, the buyer has probably not lost an animal which it was worth his while to buy.

Synovial Enlargements

(See Fig. 26.) Horses may have a variety of more or less soft enlargements in the region of the hock or hoof, due to an effusion of the joint oil or synovia. Normally the fluid is kept in its place by taut membranes; but sometimes owing to overwork when young, however, or to actual weakness of the binding tissue, the synovial sacs may bulge out in certain places where they are unsupported by ligaments, and cause wind-galls (these more commonly on the fetlocks than on the hocks), bog spavin, or thoroughpin. This class of derangement does not usually cause lameness or incapacitate a horse from work; it is merely unsightly. Therefore a mature horse, with a soft, cool swelling which is situated on the inner front of the hock, need not be refused on this score. Bad bog spavin is often accompanied by thoroughpin, which is a similar distention situated just above the point of the hock and in front of the tendon.

Capped Hocks

(See Fig. 26.) Capped hocks are common and unsightly, and lower the value of a horse; but they are of no disadvantage from a practical point

of view. Actually they are caused by an abnormal accumulation of watery matter, accumulated in a sac formed between the tendon attached to the point of the hock and the skin. They are usually due to blows either accidentally inflicted or caused by the kicking of the horse, and it is always advisable to take special trouble to ascertain whether an animal with this disfigurement is an habitual kicker in harness. Badly bred horses sometimes become the victims of a mange insect which particularly favors the hind legs, and causes the horse to stamp and fret ceaselessly in his stable, especially during the night, and during the autumn and winter. In his distress, he is extremely likely to damage the point of his hock against the stall division or wall. The obvious remedy lies in exterminating the parasites, which is easily done by washing the legs with soft soap and water, and applying a few dressings of equal parts of paraffin oil and sweet oil. When a horse rubs one hind leg against the other, stamps and kicks out, and shows every indication of extreme irritation at the back of the legs between heel and hock, as well as a scaly dry eruption, this parasite should be suspected, as it is much commoner than many people might suppose.

It is possible that an insufficient supply of bedding may sometimes lead indirectly to capped hocks, especially if an animal is startled into rising hurriedly when lying down.

Splints

(See Fig. 27.) To turn to the fore legs, we will deal first with the nature and cause of splint, which is possibly the commonest abnormal structure to be found on a horse's legs, but which only under certain circumstances, to be exactly determined hereafter, constitutes an unsoundness.

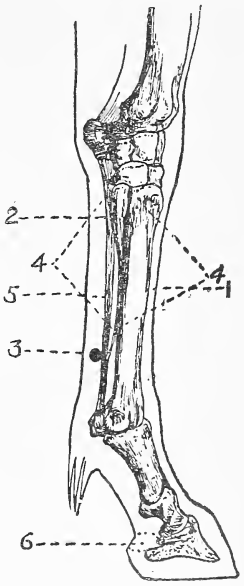

Fig. 27.—Diagram of the Outer Side of Off Fore Leg.

1, cannon bone; 2, splint bone; 3, its button-like termination; 4, position of splints; 5, suspensory ligament; 6, seat of side-bones.

The splint bones are two rudimentary, or rather vestigiary, cannon bones situated on either side of the cannon bone proper, on both fore and hind legs. They are of interest, as already hinted, as affording evidence that the horse is de-

scended from a five-toed ancestor. They represent the second and fourth digits, the horse walking upon the third. The first and fifth digits, corresponding to our thumb and little finger, have long ago disappeared. The heads of the splint bones articulate with some of the bones in the lower row of the knee and hock, hence a total loss of the former would involve considerable alteration in both knee and hock, which state of evolution has not yet been reached. Therefore our horses still continue to possess the useless and even detrimental rudimentary splint bones, as they are called, which sometimes cause him considerable pain, and may in certain circumstances depreciate his value.

Normal splint bones usually have small button-like terminations which are the only vestige left of the moribund digits, and may be felt through the skin. These little bulbs are likely to be mistaken by the uninitiated for splints, especially in breeds such as Iceland ponies, in which they are unusually well developed.

The rudimentary metacarpals and metatarsals are attached to the cannon bone by strong interosseous ligaments, which have a tendency to be naturally converted into bone with advancing

years. The disease called splint is an abnormal deposit of bone between the splint bone and the cannon bone, caused probably most frequently by sprain of the interosseous ligament and subsequent inflammation. The inflammation may, however, be set up in other ways. The jar of trotting along a hard road, a blow, or indeed any violent shock to the leg of a young horse may be sufficient to cause it, and the fact that it is so much commoner to find a splint on the fore than on the hind legs is due to the fact that the latter are far less subject to concussion than the former.

Splints seem to occur more frequently on the inside rather than the outside of the leg, and are always higher up than the bulbous termination, with which, therefore, they need never be confounded. Presumably, during the natural course of evolution, the tendency is for the splint bones to become shorter and permanently welded to the cannon bones at an early age. Until this desirable result is consummated in all horses, however, splints will continue to be a prevalent source of trouble.

Splints are serious or not, as mentioned in the first chapter, according to their position, their number, size, and activity, and the class of work

expected of a horse. They are easily felt as bony exostoses at some position along the course of the splint bones. If a horse has them on both sides of each fore leg, it should be at once rejected as too weak to be of use for hard work. More commonly only one splint on the inner side of one fore leg will be felt, and in such a case the important point to consider is its position in relation to the passage of the adjacent tendon.

Normally, the back of the cannon bone and the two splint bones form a groove for the suspensory ligament. If a splint forms on the inner side of the splint bone, the exostosis may press on the ligament, and the consequent pain will cause a chronic lameness. Again, a splint well forward and high up on the outside of the fore leg is apt to interfere with the extensor tendon. Some old carriage horses become chronically lame owing to the "growth" of a splint which eventually becomes so large as to press on the suspensory ligament, although for the greater part of life it had given them no trouble. Therefore the position is the chief factor to take into consideration when estimating the gravity of this disease.

Owing to the fragile connection in youth between the metacarpal and splint bones, young

horses, under five years of age, are most liable to this complaint—indeed, comparatively few three-year-olds escape a slight inflammation during their period of training. The lameness soon passes off, however, and rest and a mild blister will complete the cure by hastening a bony union at the injured spot. On the other hand, splints often become absorbed in old animals which are enjoying a period of rest, and it is by no means uncommon to find that they have diminished or even disappeared with the increasing years of their owner.

As splints do not constitute unsoundness unless they are actually causing lameness, and as lameness is (except in those instances in which the splint, owing to its position, causes the horse to be chronically lame) only evidenced when the splint is forming, it is safe to buy a horse with even a rather large splint on one fore leg if the growth is moribund and not unfavorably situated. In the majority of cases, as already mentioned, the growth will diminish with age, and it is in no way likely to interfere with the working capabilities of a horse.

Side-bones

(See Fig. 27.) Cartilage is extremely liable to ossify if injured. The disease called side-bones is

the ossification of the naturally elastic lateral cartilages attached to the pedal bone, and is easily felt as a hard, rough lump, which may vary from the size of a pea upward. Usually only the fore feet are affected, and cart horses rather than light horses are liable to the complaint. This is probably due to the fact that the disease is almost always brought on by external injury, and that farm horses harnessed abreast are extremely liable to tread on one another's feet when turning in ploughing, etc. That the disease is usually contracted in this way is proved by the fact that it is almost always an outside cartilage which is affected. In cart horses, not much is thought of the disease, as animals with it can perform a great amount of work on soft ground at a walking pace. It is a grave unsoundness, however, in light horses, one, moreover, which may increase as time goes on, and no horse should be purchased for trotting road work which has a suspicion of the disease. The pain of side-bone is caused by the nipping or pressure, as it were, of soft tissues between the abnormal deposit of bone and the hoof, and this is obviously likely to increase as the disease extends, and to be worse after severe work on hard roads. Cart horses with side-bones will often be lame for

a day or two after one twenty-mile journey on the road, although they will be able to work regularly on the land day after day without discomfort.

It is sometimes difficult to detect side-bone in its very early stages, as the horse may not be permanently lame, but may only "drop" a little once or twice when first moved after a rest. As already stated, the place to search for incipient disease is on the outsides of the fore feet, and if the cartilages seem to have in the slightest degree lost their natural elasticity and smoothness, the horse should be refused. The ossification usually begins as a small spot on some part of the cartilage, and from thence spreads in every direction until the entire cartilage is changed into a rough, bony mass, lacking the smoothness and sharp definition of true bone.

In bringing these remarks on a few of the common diseases of the legs to a close, it must be added that they are intended rather as a guide to the buyer than as a treatise from the veterinary point of view.

Almost every horse which is offered at an apparently fair, as opposed to a fancy price, "has something." The question usually is, Will that "something" invalid him if he is put to certain

regular work, or is he likely to turn out "practically sound"? This question we have endeavored to answer in detail under the various headings: broadly it may be stated, however, that hock troubles are likely to be increased by hunting or heavy draught work, although there are no doubt men who get all the sport they require out of a horse fired in both hocks; and that side-bones, splints in certain positions, and any feet troubles must be viewed with the greatest suspicion in horses which have to work at a fast pace upon the roads.

CHAPTER IV

Stables and Appliances

THE average individual has, as a rule, to make use of such stabling as he finds himself possessed of, and it must be confessed that very often the accommodation at his command falls very far short of the ideal. A number of inexpensive modifications can, however, generally be made, which will add not only to the comfort, but to the general welfare of the inhabitants. It must be remembered that a horse spends the greater part of his working life in the stable, and that, under these circumstances, his health can only be secured by due attention to the sanitary conditions under which he lives.

CUBICAL SPACE

It is usually said that 1,200 cubic feet is the minimum space required by each horse in a stable for the maintenance of health. As, however, the average London cab and carriage horse stables

generally allow only about half, or less than half, this number, it is apparently possible for horses to live and be capable of work in a very much more restricted area. It must be added that horses whose work takes them for long hours out-of-doors will be healthier, and will be able to live under less favorable conditions when under cover, than those who only escape from the vicinity of four walls for one or two hours out of the twenty-four. Farm horses who do their regular eight to ten hours' work daily can live healthily in stables which would be utterly condemned for the housing of light horses; but the factor which makes it possible is not any inherent hardiness of the heavier breeds, but merely their mode of life.

It is presumed that the horse-owner is giving his animals the greatest amount of cubic space that his building permits of. To aid in this desirable end, the empty stall or stalls should not be littered up with odds and ends, and allowed to become untidy, dirty receptacles for the deposit of rubbish. Every empty stall in a small stable means more air for the occupants of other stalls, and no detail of this kind is too insignificant to be overlooked.

Ventilation

The next point to which attention must be paid is to the very important one of ventilation. The correct method of securing the ingress of outside air without causing inconvenient draught is by a series of windows placed on both sides along the length of the stable above the head of each horse. If there is a double row of stalls with passage down the centre and a door at each end of the building, fresh air will gain entrance at right angles to that admitted by the windows, so that no part of the stall is unduly favored, and none of the horses are placed in a position of advantage. Below the manger, and about a foot from the floor, a row of air-bricks ensures that the air near the floor does not become stagnant.

The commonest form of stable usually found is that in which the door and window are in the centre of the front wall, the row of stalls being placed immediately opposite. The great disadvantage of this plan is that there is no through draught or free circulation of air, and such air as is admitted is on the side farthest from the horses' nostrils. It may be possible, if the building stands alone, to have a ventilator placed in the wall at each end of the stable high up, at small

expense compared to the advantage gained. Some old-fashioned stables are provided with hay-racks communicating with the loft above, and open to objections as these racks are, they may yet be desirable in an otherwise ill-ventilated stable, as they allow a current of comparatively fresh air to reach each horse.

Another plan of stabling, which perhaps is the worst of all, is that in which the door and window are at one end of the building and the stalls stretch away from them. The horse nearest the window may get some fresh air and light; but those at the farthest end of the building have to breathe the atmosphere tainted by the breath of the horses nearer the window, the mischief increasing with each succeeding horse.

Possibly one of the healthiest forms of stabling for not too artificially kept horses is a shed entirely open at one side. The roof should, of course, jut out to cover a six feet passage behind the horses' heels, both for convenience of the men in attendance and to prevent driving rain from reaching the horses. Horses kept in shedding on these lines have done remarkably well, and have been wonderfully free from the minor ailments which so constantly incapacitate those in

the ordinary stable. It must always be remembered that horses are constituted to live an outdoor life, and that they can, as a rule, stand any amount of dry cold. By reason of their great lung capacity they must have plenty of fresh air, and consequently they will thrive better under a rough shedding which is exposed to the air, than in the average small, dark, warm, ill-ventilated stable. There is only one drawback (if such it can be called) to a shed-stable, and that is that the horses kept therein must not be clipped. As the tradesman and small owner, whose horses have to stand about in all weathers, would probably in any case dispense with clipping, the drawback is not a very serious one. However, as we before remarked, every owner will usually have to make the best of what he has got, and we would only impress on him the great importance, to the welfare of his animals, of a free circulation of fresh air, which must be secured in the manner best suited to his circumstances and situation.

Stall Divisions

The usual stall division is a partition perhaps seven feet high at the point of attachment to the wall and sloping to about five feet high. Since

the importance of ventilation has been more fully realized, the wooden partition has been modified to a height not exceeding four feet, and the two feet above are composed of iron bars, which allow of a free circulation of air passing right through the stable on a level with the horses' heads. This arrangement is excellent in theory, and no doubt practically satisfactory in stalls; but we have known a spirited horse in a loose box, divided from the next by partition and bars, to get its fore legs above the bars in its endeavors to reach the next horse, and to prevent a repetition of this dangerous proceeding the bars had to be covered over with wood to obstruct the view. We should certainly recommend the barred tops for stalls, but not for the divisions between loose boxes, and it is unnecessary in the latter, where the horse can turn round in any direction it pleases. Even in stalls the bars immediately over the mangers are better covered with wood, as a bad-tempered, jealous horse will often cause terror to his neighbors at feeding time, and will frighten them into leaving or "gobbling" their food if within view.

The usual width recommended for stalls for full-sized horses is six feet and the length ten feet, but in most stables they fall far short of this;

curiously enough, too, most commonly in cart-horse stables. An excellent plan, much in vogue in France, and certainly to be recommended for hard-working horses where room is limited, is to have partitions made of wide bales, hung by two chains from a small manger-partition to a heel post, the top being about three feet above the stable floor. Besides economizing floor space, these swinging bales give the horse much more room, and allow of a free circulation of air and a thorough cleaning of the floor. Of course the objection to them lies in the danger of a restive animal getting a leg over the bale. This danger is not a very real one in the case of regularly worked animals, however, and the plan seems to have answered very well in the cases in which it has been adopted. A width of five feet will be sufficient for stalls divided by bales, although another foot is of course preferable if it can be afforded; and each bale should be so fixed as to be easily unhooked if necessary.

Drainage

Surface drains are always the best for stables, as underground drains are liable to get choked with straw and refuse matter. The most objectionable class of drain is the trap gutter in the centre

of the floor of each stall, as, unless constantly flushed with clean water, which it seldom is, it is little better than a small cesspool almost under the nose of the horse. An open gutter running the length of the stable, at the back of the stalls, with a good outfall, is sanitary if unsightly. The slope of the back part of the stalls to this gutter will require to be about one in eighty ; no greater slope than is absolutely necessary for drainage purposes should be allowed, as it is not only uncomfortable, but absolutely injurious to a horse to stand for a prolonged period with his legs at different levels.

Floors

The material for the floor of a stable must be sanitary, durable, easily cleaned, and not slippery. A variety of grooved, so-called sanitary bricks are made in these days, and no doubt some of them answer very well. A concrete floor also answers the requirements, and has the extra advantage of being one of the cheapest adequate floors that can be laid. A very rough estimate of the cost of laying concrete twelve inches deep would be about one dollar per square yard, including ramming, and to this must be added a small sum for rendering the surface with cement.

Light

There still lingers an old-fashioned prejudice against admitting light into a stable. It is said that light attracts flies which worry the horses. As a nation we are only just beginning to realize the importance of air and light to our own healths, so perhaps it is hardly surprising that these old prejudices should linger in connection with the management of our horses. As a matter of fact, flies are attracted by the manure rather than by the horses, and they will not swarm in a stable which is light, and consequently clean. Light, particularly sunlight, is essential to the maintenance of health as being the only natural germicide we know of, and as disease is usually the result of bacteriological action, the importance of allowing sunlight to penetrate the dwellings of man and beast can be fully realized. Also light is essential to the health of the eyes. For these reasons, and for the additional one that dark stables are usually dirty stables, as much light should be admitted as possible. However ill-constructed a stable may be, much may be done toward keeping the inmates in good health by keeping the doors and windows open as much as possible to admit both light and air. Only too

often everything is shut up at night, and the heat and foul air which meet one when the door is opened in the morning is eloquent testimony to the need for more thorough ventilation. The windows can at least be left open all night, and bars or stout wire netting can be fixed across the opening to prevent the entrance of undesirable intruders.

Mangers

The modern manger is usually made of iron, and although preferable, from the point of view of cleanliness, to the old wooden manger, it is very often made much too small and shallow. A projecting lip on the inside certainly, to some extent, prevents the food from spilling ; but, as a rule, the manger is much too small to hold a big feed of cut hay and oats without waste. Almost every horse noses a mixed feed about, and unless he has plenty of room a certain amount is bound to get spilt. A most satisfactory manger is in reality intended to hold the hay, and is deep and low, and the horse can root about in it to his heart's content without losing a morsel of his food.

The usual method of attachment of a horse to the stall is by a rope fastened to the head-stall,

which runs through a ring in the centre of the edge of the manger, and is weighted by a block of wood on the end of the rope. The latter should fasten to the head-stall with a spring hook.

Hay-Racks

Many people object to the overhead hay-rack, because they consider this position for the food unnatural, and also because it allows of the possibility of seeds, dust, etc., getting into the horse's eyes. Against a low rack is urged the danger that the horse may injure himself by getting his foot into it. There is certainly much to be said in favor of the overhead rack on the score of waste, as it is undoubtedly an advantage to have the manger beneath to catch bits pulled out by the horse. The waste with an open-barred low rack is very considerable, and if racks in this position are used, it is much better to have them boarded up.

General Remarks

From the few remarks made on the most important points in connection with stable construction, it will be seen that every owner can, as a rule, do something to remedy defects in the building at his disposal. The point of greatest impor-

tance, we must repeat, is ventilation, and it is always possible to keep windows open, and, if necessary, substitute a door in two parts for the ordinary door. Furthermore, ventilators can be added at very small cost, if the stable stands in such position as to allow of holes being made through the end walls. If the drainage of a stable is defective or unsanitary, it is better to stop it up and use none, than to have the horses standing for the greater part of their lives over miniature cesspools. If the stalls are carefully and thoroughly cleaned out daily, there is no actual need for a system of drainage, and horses can live healthily on bedding of sawdust or shavings—in fact some people, to whom expense is no object, use one of these materials in preference to straw. Box stalls are preferable to ordinary stalls in more ways than one, but are, of course, impossible where space is limited. The ability of the horse to turn about and stand in any direction, of which he always avails himself, is of incalculable benefit to the animal. He can get out of draughts; he can place himself in a position to attain the greatest amount of fresh air; and the power to move about, instead of being constrained to stand in one position, enables him to obtain thorough rest when

fatigued. A horse which has the freedom of a loose box never stands in the position in which he would normally be tied, and presumably he chooses the position which is of greatest comfort to himself. It is always possible to improvise a box stall or two at small expense. Two movable bars placed across the end of a six foot stall will make a good loose box for any pony up to 14.2 hands, and is, in our experience, exempt from any serious objections. The end stalls in a stable can be turned into box stalls by putting a couple of bars from the stall partition to the opposite wall, thus adding the width of the passage to the length of the stall. This method is open to the objection that the loose horse can, if it so desires, reach its neighbor in the next stall, and the ability to do so may lead to a tooth and heel battle, with unpleasant consequences. Grooms always object to box stalls, and will keep the horses tied up in them if not sharply looked after. Their opposition is due to the slight amount of extra work entailed; and the only real objection ever experienced is that their use adds slightly to the straw bill, which additional expense is more than compensated for by the increased health and energy of the horses kept in them.

If stable room is very limited, the substitution of bales for the stall division will allow of each horse being kept in a more restricted area, and in cart-horse stables, the inmates of which are too regularly worked to get into much mischief, it is better to do away with stall divisions altogether, than run the risk of getting an animal cast in the very narrow stalls which are so often provided.

Building Stables

If it falls to the lot of the horse-owner to have to build stables, he cannot do better than put himself in the hands of a firm which makes a specialty of constructing them, seeing that due attention is paid to the points indicated. If expense is an object, however, he may cheaply construct a wooden stable, which will be healthy and sanitary, on the following lines:

The walls are best made entirely of brick, though these can be substituted by a dwarf wall of bricks, surmounted by two-inch yellow deal creosoted boards or slabs. The roof should preferably be tiled, and, in every case, boarded under; but good felt tarred every third year will last twenty years. In no case should corrugated iron be used either for roof or walls, because even

when boarded inside it is much too hot in summer and cold in winter.

The site of the stable is a point of importance. It is necessary to admit sun without placing the building in such a position that it becomes unendurably hot in summer. North is out of the question. Due south is tempting, because it will catch every ray of sunlight in winter; but this position will be too hot in summer unless the building can be placed beneath deciduous trees. The selection of a frontage to east or west must be decided by the prevailing wind of the district, and in a part of the country where sou'westers prevail, the choice must fall on the alternative direction.

The floor must be of grooved concrete, with slight slope to an open gutter running along the back of the stalls, with fall to either end of the building.

Each stall should be as wide as possible (the minimum being five feet), and the divisions, for the sake of economy, may be made with bales.

The mangers should be divided into three divisions. On the left a box-like receptacle, two feet four inches deep, and at its edge about two feet ten inches to three feet from the ground, to hold hay. Next to it another division on the

same principle, but less deep, to hold the mixed feed and oats; and the third of much the same dimensions, wherein the bucket of water can be placed.

The door of a small stable, to hold up to five horses, may be placed in the centre of the building, and should be made in two halves, so that the top can be left open if desired. In a longer stable there should be a door at each end. A passage not less than six feet wide must run between the drainage gutter and the outside wall. Ventilators should be placed above each stall and below each manger, and two windows going well up to the top of the building, and capable of being opened both top and bottom, may be placed on either side of the door.

The favorite position of a harness-room is usually leading out of the stable. As the fumes from the stable, the steam from hot horses, etc., is liable to tarnish the metal, it is usual to recommend that the harness-room be cut off entirely from the stable, and approached from outside. Grooms object to this plan, as it entails carrying the harness through the rain in wet weather, and, from their point of view, this is no doubt a drawback. Where space and economy are important, it may

be necessary to keep the harness in the coach-house, and this is certainly less objectionable than keeping it in the stable itself, though undoubtedly less convenient. The elaborate iron fittings which adorn the modern harness-room may be cheaply replaced by a few wooden pegs, etc., but it must be remembered that the angles of all wooden triangular saddle supports should be carefully "stopped" with putty, or the interior will become a harborage for moths.

CHAPTER V

Food

Oats

Long experience and analysis have proved oats to be the best grain for horses, as, indeed, they are for many other animals, including man, the reason being that the chemical elements of oats are such as are best suited to repair the waste caused by long-continued exertion. Animals doing hard and fast work require food containing a large proportion both of nitrogenous and non-nitrogenous principles. If the former elements are wanting in sufficient quantities in the diet, the animal will become deficient in muscle; if the latter are lacking, the animal will become thin. Thus a good deal depends on the class and quality of oat supplied to working horses, and every horse-owner should make himself acquainted with the characteristics which distinguish them.

Good oats are plump, clean, hard, and sweet, with the appearance of almost bursting out of

their husks. The husks should preferably be thin, because thin-skinned oats will necessarily contain more flour per bushel than oats which are thick-skinned. All the grains in a good sample should be much of the same size, and should be of a short, plump variety rather than long and thin. Of course, the shape and color of the grain depend, to a certain extent, on the particular variety of oat under consideration; but, as a broad rule, it may be laid down that as black oats grow on inferior soils, and as long, thin seeds are usually a characteristic of common, unimproved varieties, preference should be given to plump white oats, which, moreover, are thinner skinned than black ones. The sample should be free from weed seeds.

Oats which are darkened or reddish in color, or which are shriveled at the ends of the husks, or which have a peculiar smell and taste, should be suspected of being kiln dried, and rejected accordingly. Damp, musty, or mouldy oats are, of course, unfit for food.

It is never advisable to buy crushed oats, as the grain used is likely to be of inferior quality. If crushed oats are desired, the whole grain should be bought, and (if not crushed in a hand-mill at home) taken to the miller, and crushed under su-

pervision. The usual cost for crushing is about twenty-five cents per sack.

Good oats should weigh forty pounds to the bushel. Inferior qualities may weigh as low as thirty-two pounds, but good oats at a high price are far cheaper for feeding purposes than those of poor quality. It is usual to buy oats with the stipulation that they shall weigh so much (not less, we will say, than thirty-eight pounds) per bushel; but a dealer should never be allowed to make up the number of pounds to the bushel by giving increased quantity, as, apart from the question of weight, the nutritive quality of good oats, grown on good soil, far exceeds that of inferior grain, and a few pounds' weight added to the measure will not make up for the loss of quality in the bulk.

Other Grain

Corn is often used instead of oats, and answers very well for cart horses or horses doing slow work. It is the only other grain which is at all suitable for horses, barley and wheat being too heating if given in any quantity.

A good economical mixed ration for cart horses in regular work is a mixture of beans, oats, barley,

and corn, but it is unsuitable for light horses which are expected to do fast work.

Beans contain a greater proportion of nutritive material than oats, and are beneficial if given in small quantities to old animals or those undergoing extremely hard work. They should be given split, and a "double handful" per diem, in addition to the usual quantity of oats, is a fair allowance for the average horse.

Hay

Hay being the staple food of the horse, every owner should make himself conversant with the various points upon which the quality and value depend.

The quality of hay is dependent, first, upon the grasses of which it is composed. Between twenty and thirty different grasses may be found in hay, only a comparatively small proportion of which go to make hay of the best quality. Inferior hay consists mainly of inferior grasses: good hay of about ten varieties of the best grasses.

Now the variety and proportion of the different grasses which grow on land is largely, if not entirely, influenced by the soil. The best grasses only grow on good soil, so that coarse, rank stuff

is an indication that it comes from a poor soil, and as the nutriment in grass is all extracted from the soil, hay from such land will be non-nutritious and of small feeding value. Again, there is considerable difference in the quality and feeding value of upland, lowland, and water-meadow hay. As only certain of the best grasses are to be found in upland meadows, upland hay is characterized by the fineness of its herbage, the narrowness of its grasses, and is far the best quality of hay to be got. It should always be supplied to horses doing fast work. Lowland hay is known by the coarseness of its stalks and the broad leaves of its grasses. Water-meadow hay is coarse, and often full of reed- and rush-like plants, and, although good cattle grass, is considered unfit for horses.

The characteristics of the best hay are crispness and green color, sweetness of taste and aroma, the presence of numerous early grasses in flower, and a proportion of fine herbage.

As stated above, water-meadow hay is generally considered unsuitable for horses. A third factor, that of the time at which the hay was cut, has such an important bearing on its subsequent feeding value, however, that it is necessary to enter into a few details with regard to hay-making as it

is, and as it should be conducted, to show how the value of hay may be influenced by the cutting. The average farmer often delays cutting his hay in the hope of getting greater bulk of under-grass. It is a common sight to see fields of standing brown herbage so dry that when it is cut it needs no making. The greater part of the nutriment of all crops passes into the seeds and is exhausted in their production—for instance, the feeding value of straw is comparatively small because the greater part of the nutrient properties has passed into the grains of wheat, oats, etc., as the case may be, and the same principle applies to grass. If, therefore, grass is cut after the seeds are formed and have fallen out (as they immediately do when ripe), the most nutritious part of the crop is lost, and all that is left for the horse to eat is that portion which has been robbed of its most valuable constituents. For this reason we should prefer to buy, at equal prices, a ton of despised water-meadow hay which was early cut, while all the grasses were yet in flower, to a ton of upland hay from the best land which was cut late. Consequently it is almost impossible to lay down any hard-and-fast rules for the guidance of the novice in the purchase of hay, for in certain cases coarse hay, containing a

quantity of inferior grasses, may be of better feeding value than that made from herbage of the finest quality. Experiments have proved that hay made from grass cut early will fat a bullock alone, while hay from similar land cut late has proved quite incapable of doing this without the addition of cake, etc. Furthermore, the way hay was saved may make an appreciable difference in its feeding value, apart from the actual quality of the herbage. Grass may be cut early when all the grasses are in flower, and yet, owing to bad weather, it may have required so much tossing and turning, and have lain about so long, that by the time it gets to the rick all the sugar will have been washed out of it and its value thus reduced. The careful modern farmer turns and tosses his hay as little as possible, for he knows that the better will the feeding value be. The old method of tossing hay with a pitchfork is quite obsolete, and a careful turning over with a hand-rake is the most that is required in a favorable season.

Mow-burned hay may be recognized by its strong smell and dark color. The condition is due to heating in the stack, and although horses are fond of it, it is apt to act deleteriously on the kidneys if given to them in any quantity.

Dust in hay is generally due to the hay having got slightly over-dry. The so-called dust is in reality the outer layers or coats of the stems and leaves in a state of dessication. Dust may also be caused by blight having fallen on the grass when standing. In any case, to whatever due, dust in hay is an indication that the hay is not in the finest condition. Hay which is actually mouldy is obviously unfit for food, and its use will lead to a form of indigestion which will be likely to result in broken wind.

New hay, *i. e.*, hay made in the same year, should never be used before Christmas, as it is apt to cause scouring. Well-saved hay is at its best at from one to two years. When older than this it will have lost much of its feeding qualities.

Good clover hay is fattening, and is much liked by horses. It is not so suitable as meadow hay for animals which do fast work, as it militates against hard condition and good wind.

Straw

Straw has more feeding value than is usually supposed, although, compared to hay, these properties are, of course, not high. The whole secret of its value as food or the reverse lies in the time

at which the crop was cut. By reason of their liability to seed out, oats are always cut fairly green, when, consequently, a lot of the nutrient material is still in the straw. Oat straw, then, which is known to have been early cut, may make an excellent addition to the forage of horses which are not expected to gallop. Wheat straw is cut when the grain is comparatively ripe, so that there is little if any nutritive material left in it. Barley is cut dead ripe, and the straw, for this reason, as well as for another to be mentioned hereafter, is practically valueless either as food or bedding.

Other Foods

Bran is generally used in the stable in the form of a bran mash, which is made by pouring as much boiling water on dry bran as will be absorbed, adding salt, and putting a handful of dry bran on top of the mixture to keep in the steam. Given on Saturday nights instead of a feed of corn, this mash will, by its somewhat laxative action, help to keep in health those horses which spend their whole lives in the stable with never a run at grass. Dry bran has an astringent action, and is, consequently, not to be recommended as part of the regular dietary.

Large quantities of bran should never be bought at one time. It should, when fresh, be free from any slight musty or sour smell.

Linseed is also slightly laxative, and is to be recommended as a conditioner. It should be boiled to a jelly, and a small teacupful given daily with the corn for a few weeks will make a marked improvement in the appearance of a horse's coat. Harsh-coated horses will particularly benefit by a course of boiled linseed.

Artificial foods and "conditioners" are not to be recommended. The buyer can never tell what they are made of, and if guaranteed free from injurious ingredients, the price will be prohibitive to the ordinary pocket. A horse which cannot live and thrive on a good quality of natural food is not worth keeping, and is certainly not sufficiently valuable to warrant the spending of dollars on patent foods of doubtful benefit. If something extra is required for a horse which, say, is recovering from illness, or is from any cause run down, the owner can buy the "raw materials," such as locust-bean, linseed, ginger, and Indian corn, which is what these foods are usually composed of, and mix a food for himself at a quarter the cost, and with the satisfaction of knowing what he is giving.

CHAPTER VI

Stable Management

Appliances

Every horse-owner will have to provide himself with a certain number of stable tools, and below is a list of those that are absolutely necessary in the smallest stable.

Pails

The first item to be purchased will be buckets, at the rate of one per horse if several horses are kept, or two for one horse, three for two. Best oak pails cost about seventy-five cents each; if painted, about $1.00; galvanized pails a little less. The latter, if of good quality, and consequently strong, answer their purpose as well as the more expensive oak, but will not last so long. If economy is the order of the day, carefully-selected lard buckets, which are to be got at any grocer's, will be found as useful in the stable as they are for many other purposes. We say "care-

fully selected," because the buckets vary slightly in the quality and thickness of the wood with which they are made. They have a copper-wire handle, which is perhaps their weakest point; the handle from a worn-out zinc bucket can, however, be fastened on as a substitute when the original handle has succumbed to the strain. These buckets cost very little, and if given a coat of enamel, they pass very well for the real thing. From a sanitary point of view, zinc pails are preferable to wooden ones, as the inevitable deposit from the water is more easily and thoroughly cleaned off.

Brushes, etc.

Two brushes and a comb are the least that can be done with. A "dandy" brush is indispensable in every stable, and a body brush is required to supplement the dandy if the horses are to be even moderately well turned out. A dandy brush costs fifty cents, and will generally last a year for a couple of horses, after which its remaining fibres may be cut down, and the brush will be useful for a variety of purposes. The back of a dandy brush should never be dipped in water, nor should the fibres be wetted except when the brush is occasionally washed, if it is expected to last. The

flat body brush, with its strap across the back under which to put the hand, is a more expensive affair to buy, but as it will, with ordinary care, last several years, its cost will in the end be less than that of the dandy. A strong mane comb, a small "pick" wherewith to clean the hoofs, and a currycomb are the only other really necessary items of the toilet, with two or three rubbers or dusters with which to give the final polish. We have purposely omitted to mention a water-brush, as modern stable management condemns the practice of washing the feet of horses.

Other Accessories

The coach-house and harness-room accessories depend on the style in which the vehicles are turned out. The least that can be done with in a gentleman's stable is as follows:—wheel jack, spoke brush, cushion brush, sponge, and chamois leather for the carriages; globe polish, saddle soap, silver sand, harness blacking and brushes, and burnisher for the harness-room, as well as sundry rubbers and dusters or rags.

Of course, a feed-cutter is an excellent and useful addition to the stable, and is worth getting if several horses are kept; and a sieve and quarter-

peck measure will be required in a stable of the smallest dimensions. A pitchfork, shovel, and broom will be required for cleaning purposes; also a wheelbarrow if one cannot be borrowed from the garden.

Routine Management

The first thing in the morning the groom should clean out the stable, removing all soiled litter, and flushing out drains if such exist. The horses should then have their morning feed of oats or corn and hay, and a bucketful of fresh water. After their breakfast they should be cleaned, either in or out of the stable. It is always preferable that each horse should be taken outside if possible for this operation, as it is objectionable that the dust and débris should fill the stable. The most important part of the toilet is a vigorous grooming with the dandy brush. The object of brushing, which grooms are often apt to overlook, is not so much to get a gloss on the animal, though this is no doubt desirable, but to apply friction to the skin, and thus remove dead cuticle. The gloss is more a matter of general health than an indication of good grooming, and a horse in the most perfect health and condition will carry a bloom without

the assistance of elbow-grease. When the mane and tail have been combed and brushed, and the hoofs picked out, the toilet of the horse may be considered to be completed. If the owner has doubt as to the efficiency of his groom's work, he can get a fair idea of how the horse is cleaned by parting the hair of the tail. Much gray dust or grease at the roots of the hairs is a sure sign that this part receives but little attention from the brush, and it is then fairly certain that the body of the horse is in the same condition. One should always be able to run one's hand over the body of a well-cleaned, healthy horse without getting an appreciable amount of grease thereon, and the presence of much grease suggests either that the grooming or the exercise, or both, are neglected. These remarks apply, of course, to horses which are constantly stabled. Horses at grass are always greasy.

It is customary, as a rule, to feed horses three times a day. The midday feed, like the morning one, is usually chaff or hay and oats, and the same ration is supplemented in the evening by a rackful of hay.

It is usual in most stables to allow the horses to stand on straw all day. It undoubtedly looks

nicer; furthermore, it is urged by advocates of the practice that horses will be liable to slip upon the bare floor, but this rarely if ever occurs. This standing on the bedding, and the consequent continual wetness of the floor, is the most fruitful cause of thrush, and probably, indirectly, causes more broken knees than is generally realized. The bedding should always be removed in the daytime, and, if possible, put outside, where it will get purified and dried by the air and sun. The stable floor will thus become clean and dry, and the result of these measures will be apparent in the health of the feet of the horses so treated. The half measure of thrusting the straw under the manger, where its presence is injurious to eyes and lungs, is worse on the whole than leaving it down on the floor, and every horse-owner should insist on its entire removal for a few hours during the daytime.

Washing Feet

It is the custom in some stables to wash the feet of horses when they come in from exercise or work. The prevalence of cracked heels, grease, thrush, and other evils which more or less incapacitate a horse for the work which he has to

perform, has led to the closer study of the matter, and has resulted in the discovery that the above-mentioned ills are entirely due to (or, at any rate, can be entirely prevented by abstention from) washing the feet and legs. The evil lies, of course, in the drying rather than the actual washing. The extreme cold produced by the rapid evaporation of the half-dried hair drives the blood away from the part, and the consequent cold feet are liable to eczema and cracked heels. The clipping of the hair off the back part of the fetlock is another predisposing cause. Bandaging the legs immediately after washing may to some extent prevent the evil; but the only true and satisfactory method is to clean the legs with a wisp, and never allow water to be applied to them. Grooms object to this, as it gives them more trouble and the legs do not look so nice; but it should be insisted on. The slight dust and mud collected by the feet during exercise has been found to be the reverse of prejudicial if left on, and no horse-owner need fear any ill effects from departing from the old-established method of washing the feet and legs of horses. He will find, on the contrary, that his stable will be absolutely free from those complaints to which nine

out of ten stabled horses are subject in the winter.

Mud fever is another ailment which can, as a rule, be traced to faulty methods of management. At one time quite a large proportion of clipped hunters and harness horses in certain districts were the victims of this complaint. It has now been found that if the mud is left to dry on the horse will never suffer from any inflammatory condition of the skin. This may seem a somewhat drastic and dirty method, and it does not recommend itself to tidy grooms, but it is the only sure preventative of the complaint. In those stables in which the owner takes an intelligent and active interest in his animals, the hunters are turned into their boxes with legs and belly uncleaned, and the dried mud is not removed until the following morning. This practice has been attended with the happiest results as far as the health of the horses is concerned, and it is to be recommended to all who wish to keep their animals fit and well, and free from those tiresome minor ailments which incapacitate a number of harness horses and hunters every year. The practice of washing the bodies of horses is not to be recommended under ordinary circumstances, as it has a tendency to

check the action of the oil glands, which, under natural conditions, secrete oil to assist the thatch or covering of hair to turn off rain; also, unless each part is immediately and thoroughly dried, one of the above-mentioned skin diseases will be likely to appear.

A sweating horse should be immediately dried on its return home by vigorous rubbing with hay or straw wisps. If a heated horse is allowed to dry by evaporation it will probably contract a chill. The extremities should always be dried first, and while this is being done a blanket should be thrown over the body. A fruitful source of coughs and chills is exposure of the heated back and loins to the cold while the groom is drying legs and head. The saddle or harness should always be left on while these parts are attended to, and in addition, if the horse is very hot, a blanket should be thrown across the loins. While on this subject we may suggest the advisability of always throwing a light cloth across the loins of the clipped harness horse in winter if it has to stand about out-of-doors for more than two or three minutes.

If for any reason it is impossible to immediately dry a perspiring horse, the evil consequence which

may result from the delay may be minimized by clothing the animal warmly and putting on bandages, or by having it led about with saddle on until it can be attended to.

Grooming with a hard brush immediately after exercise is essential to the health of a horse, as the pores are then all open and the brush will thoroughly clean the skin. Extra grooming should always be insisted on as a substitute for exercise in bad weather.

Clipping

Well-bred horses kept continually stabled seldom want clipping, and if the animals have to do work which entails much standing about, it is certainly not to be recommended. Clipped horses are easier to clean and dry, and can (theoretically) do their work better, than horses carrying a long winter coat; but against this it is necessary to put the increased liability (and consequent risk of total or temporary loss) of the animals catching cold, and the additional expense of providing blankets, clipping machine, etc. The method of clipping the legs and belly only, with the idea of leaving a warm covering over back and loins, is not to be recommended, as the horse is as likely to contract

chill if his extremities are bare as if he was entirely clipped. In rough countries the legs of hunters are often left unclipped to save them from slight injuries. Some people leave the hair under the saddle of a riding horse. Is is difficult to see what benefit results from doing so, as the long hair can only add to the heat of a part which will in any case become heated, and the risk of a sore back is increased thereby.

One thick cloth is enough covering for the body of a clipped horse in the average stable. The legs and feet of the horse, which has had his hair artificially removed from them, get colder than they ought, and for this reason the hair should be left on the legs of all horses, whatever their work. If the hair is removed, bandaging is the only way in which the extremities can be protected, and continual bandaging is not advisable. The horse-cloth should always meet over the chest. It must always be remembered that the horse must naturally feel the artificial removal of his protective covering during the time of year when nature has provided him with it because he requires it, and that, therefore, he must be supplied with a fair substitute if it is desired to keep him in health and condition. It is usual to supply a common night-

blanket to save the better day-cloth from the inevitable soiling when the horse lies down.

In some stables it is the practice to keep the horses clothed practically all the year round in one kersey cloth, and to load them with two or three when clipped. The horse's hair is, no doubt, made finer and shorter by this treatment; but it must also be weakening to an animal to be so loaded with hot blankets, and the liability to chills at all times of the year is, of course, intensified. The fewer blankets the better in every stable, especially for horses such as hunters, whose work entails a lot of standing about in every class of weather.

Clipping should not be commenced before the end of the first week in October, and may need to be done once again before Christmas. No horse should be clipped after Christmas, or it will be very late in getting its summer coat. If the removal of the hair is left until the coat is "set," which will be early in November, the operation will only need to be performed once.

Bedding

The choice of bedding lies between the various straws and sawdust. Some few people favor

sawdust because of its slightly antiseptic properties, which they consider beneficial to the horse's feet. When straw is scarce there is no reason it should not be used as a substitute, provided all the drains are carefully stopped up. For horses which eat their beds, some substitute for straw has to be provided, and we should prefer sawdust. The latter is only to be recommended if the owner is unusually favorably situated for obtaining it easily and cheaply. About 100 lbs. per week will be required, and the sawdust should be entirely renewed every week. Grooms will generally raise objections to the use of sawdust, because it is apt to make the stable and the horse very dusty, and consequently their work is increased.

Of the various straws, wheat is, in every respect, the most suitable for bedding. Oat straw is too expensive, and also few horses will be able to resist the temptation of eating it. Barley straw should never be used, as the "awns" get into the horse's coat, cause intense irritation, and subsequently lead to a skin eruption. All "bearded" straws are open to the same objection. Therefore we are perforce reduced to common wheat straw, which varies in price, according to

district, season, etc. About thirty pounds a week will make a good bed for one horse; but under strictly economical management, and if the litter is turned out and dried daily, this allowance can be considerably reduced. In all cases a thick bed should be provided, as it adds to the rest, comfort, and therefore to the general welfare and working capacity of the animal.

CHAPTER VII

Feeding and Watering

Feeding

As already remarked, hay and oats is the staple food of the horse. Corn is not a natural food, and it is questionable if too large a proportion in the dietary is not absolutely injurious. As we keep horses in an artificial manner and work them, we must presumably feed them to a certain extent artificially to enable them to perform their duties. At the same time, it is constantly proved that horses are capable of long and sustained exertion on a dietary of nothing but grass. We hear of men in the far West catching up a horse and riding it for distances such as we should not dream of traversing in the Eastern states, and the animal is apparently in no way the worse. It is doubtful, however, if a grass-fed animal would be capable of doing regular hard work under these conditions, although it is certain that it is capable of violent exertion occasionally. Many horses,

however, live on grass alone, without the addition of dry food, and are not less active or capable than stabled horses. In autumn and winter, though, they are liable to sweat profusely if driven far, and in consequence of the danger of a chill from this cause, and the difficulty of drying the long coat thoroughly before turning out again, it is perhaps inadvisable to keep out at grass all the winter a horse which has to work regularly. As hinted in a previous chapter, it is not wise to clip horses which are kept in the stable.

Presuming, then, that a horse is regularly worked, he will require a proportion of oats in his dietary. The regulation cavalry allowance is twelve pounds per day, given in three feeds, and experience has proved that it is sufficient for animals doing regular work. Hunters are often given as much as fifteen or sixteen pounds, and the same amount is the average quantity consumed by race-horses in training. There is no doubt that the harder the work the greater the quantity of food required; but we question whether the additional food, always remembering that oats are not a natural food, is not best suited to the horse's stomach and digestive capacity if it takes the form of best quality hay. Four quarter-

peck measures, or ten pounds of oats (each quarter-peck measure weighing two and a half pounds if the oats are of good quality and forty pounds to the bushel) per diem, should be ample for a sixteen-hand carriage horse doing daily work. When doing little work, one measure less is sufficient.

The demeanor of the individual is the best indication of the quantity of oats which suits him, as horses undoubtedly vary in the amount which they require and which is good for them. Unduly exuberant spirits, and a playfulness which borders on the dangerous, is generally an indication that the work is inadequate for the food, and a better adjustment, by the reduction of the latter by a "feed," will usually result in a rational sobriety.

Some horses are unable to "stand" corn at all, and do not thrive as well if it is included in their menu. Such animals are usually what we might call the less refined members of the race—the older, less improved varieties. The more thoroughbred blood a horse possesses, the more corn will he be capable of assimilating, and the less well will he do without it as a rule. As thoroughbreds are practically raised on oats, their digestion has presumably adapted itself to this food. Ponies,

on the contrary, can rarely stand oats, which immediately "get into their heads," and cause them to be unruly and unmanageable. Oats are said to be unsuitable, also, for Arabian horses, and one of our greatest breeders cautions purchasers against feeding horses of this variety on the regular system, and advocates a diet exclusively composed of hay and grass. The exciting principle in oats, it may be mentioned, is an albuminoid called *avenine*, and its bad effects are minimized if the oats are given bruised or ground.

Ponies under twelve hands, then, will do better on hay only, and all ponies which are doing little work will thrive best if corn is withheld. Ponies of about fourteen hands, which are doing hard and regular work, may have an allowance of two quarter-peck measures daily if they can stand it.

It must always be borne in mind that the corn must be regulated to the work, and that it is only needful as an addition to hay or grass when or because a horse is working. Also that, as a rough rule, the longer hours a horse works, the more oats will he be able to consume with benefit to himself, and, consequently, the more work will he be capable of performing. In mentioning the necessary allowances of oats, it is, of course, pre-

sumed that the grain under consideration is of the very highest quality.

Hay

The horse is so fashioned as to require a certain proportion of bulky food for the mechanical distention of his stomach, without which it will not act properly. Hay, in the absence of grass, fulfils this function, and for this reason it is not correct to give a dietary of oats *ad lib.*, with a little hay as an addition, but exactly the opposite, and, presumably, more natural and healthy régime. It is customary to give chopped hay with the oats in many stables, with the idea that it will prevent the horse being able to "gobble" his feed up too rapidly. We fail to see any advantage in this mixed ration, and it is liable to give rise to several undesirable results. For instance, a horse will generally "nose" out a good deal of the chopped hay to get at the grain, and a proportion of the feed will in consequence be wasted. Also, the owner is sometimes tempted to cut up inferior hay with the idea that the horse will eat it thus, though he would refuse it if given whole. As bad hay is equally injurious to the animal whether he eats it long or short, this practice cannot be too

strongly condemned, and we would also particularly warn the horse-owner against buying hay already cut. The commonest trick of the hay merchant is to cut inferior stuff, and deliver it as a portion of the purchased load, as in this way he saves a bale or so of the good hay for which he has been paid a fair price, and substitutes some damaged fodder which is probably worthless and unfit for food for horses. If chopped hay is used, it must be cut at home from such samples of hay as would be given to the horse long; but, as we have already suggested, such slight advantage as may accrue from its use is hardly worth the expense of purchase of a feed-cutter, and the waste of a man's time using it.

The army ration of hay is twelve pounds, and this is no doubt sufficient for a horse in ordinary work. If the oat ration is cut down the hay allowance must be proportionately raised, and for every pound of oats which is saved three extra pounds of hay should be given. For animals doing hard work we should allow as much hay as they will eat, which amount will soon be arrived at by experiment and observation. Horses which are leading an easy life will need to be rationed if it is desired that they do not become unduly

fat. In any case, if a horse "picks over" his hay, pulling out and neglecting all but the choicest locks, it is an indication that he is being supplied with too great an amount. Ponies of fourteen hands which are not having oats will need twelve to fourteen pounds per diem; small ponies under twelve hands eight to ten pounds. One should never stint hay to any variety of horse, preferring rather to limit the oats if a reduction in the dietary is necessary. If chopped feed is given, a proportion of the above-mentioned allowances must of course be cut up.

It cannot be too strongly impressed upon the horse-owner that the food must be regulated to the work of the individual, and that consequently it is impossible to lay down any hard and fast rules about the quantity of food required. Too fat a horse is as incapable of doing good work as one too thin, and the object must always be to keep the animal in that condition which will best enable him to perform that which is required of him with the greatest ease to himself.

Turning Out to Grass

It is undoubtedly beneficial to every horse to get an annual run at grass. Not only does the

change to their natural diet have a good action on the digestive organs, but their feet also benefit. The temporary loss of "hard" condition is of small consequence when compared with the gain in health which results. Every horse-owner is not, however, in a position to be able to throw his animals out of work while they indulge in a well-earned holiday, and to these it is suggested that they should turn their horses out at night all through the summer, giving their usual corn ration but no hay during the day, and working them as usual. By this method no loss of condition will ensue, and the horses will be found to work as well as when kept entirely stabled. The change should be made gradually, and the animals turned out for an hour or two at first only. Also before bringing them in for the winter their hay ration should be begun, and daily increased for a week or two before bringing them in altogether. Horses may run out at night from about the first week in May until well on into September.

It is not advised, under any circumstances, to turn horses out during the daytime in summer as is so often done by the inconsiderate owner, unless the animal has its natural mane and tail. The cruelty of turning out a docked (and hogged) horse

in the daytime cannot be too strongly condemned, for when deprived of his only protections his existence is merely one of misery and irritation. The torment to which he is subjected by the myriads of flies deprives him of all peace, and he is unable to feed or rest. Under these conditions the practice is simple cruelty. The same mutilated horse can spend the night in comparative comfort, and will gain the full benefit from the changed conditions of his existence if taken indoors not later than eight o'clock every morning. If a horse has a long mane, tail, and forelock, there is less objection to leaving him out all day, though he will spend all his time in some shady corner and will not get much food or rest.

Watering

Much diversity of opinion exists as to the best methods of watering horses. In a natural state the wild Equidæ drink only once or at most twice a day, consequently we might be tempted to presume that our horses are not thirsty animals. We must remember, however, that we feed our stabled animals on food which is entirely lacking in juiciness and natural moisture, and that therefore they are obliged to acquire this necessary moisture by

drinking a great deal more water, and by taking it oftener, than they would need to if fed on naturally juicy food. The horse's intestines are so formed that they can drink a large quantity of water at a time, so that the common practice of watering a horse three or four times a day is founded on the natural capacity of the animal. It is better, however, to always stand a bucket of water in the stall or box, so that the horse may take it when he likes and in what quantities he fancies. Furthermore, horses when eating dry hay, etc., will be seen to constantly take a mouthful of water wherewith to moisten it if a bucketful is within reach. Under these circumstances the bucket should be refilled each time the horse is fed, and it is strongly urged that every horse-owner adopt this method, and keep water always within reach of his animals. Some people have protested against standing a bucket in the corner of a loose box on the score of possible injury to the horse by getting his foot into it; but no accident from such a cause has ever been reported. If the manger is unsuitable to stand a bucket in, the latter could no doubt be dropped into an iron support attached at a convenient height to the wall.

Horses should always be watered before they

are fed, as water given in any quantities after food is liable to cause colic.

There is no objection to allowing a horse to drink a bucketful of cold water immediately he comes in heated from work. If he is much exhausted, however, or if he has had time to partially cool, the cold water should be withheld, as it may lower the whole temperature of the body, and cause chill. In such cases a little tepid water, or a bucketful of warm gruel, will be beneficial.

Horses always prefer soft water to hard; spring water to well water. Rain water collected in tanks is not wholesome, as it is generally full of a quantity of decomposing matter. Obviously, only the cleanest, purest water, such as would be drunk in the house, is fit for horses. Many fallacies exist with regard to the most suitable water, and there is an example of a coachman who habitually gave his horses soapy water to drink, with the idea that it was better for them than the clean, pure liquid. No one can go wrong if they give the best and purest water, and plenty of it. A horse will drink from five to eight gallons a day, and it has been found that the animal will drink a much greater quantity when watered than he will if he always has access to it. Naturally a horse should

never be watered immediately before going out to work. All these small rules require attention if the method of watering is persisted in.

Salt

A lump of rock-salt should have a place in every manger.

CHAPTER VIII

The Care of the Feet

It is necessary to pay great attention to the feet and legs of a horse, as there is no truer saying than "No foot, no horse." Blacksmiths are not always infallible, and it is advisable to know what ought and ought not to be done when one's animal pays its periodical visits to the smithy. The first essential is to preserve the foot in a sound and healthy state, and if this is done, almost any kind of shoe will be found to answer fairly well.

The foot consists of an outer wall or crust; the bars, which are a reduplication inward of the crust at the heels; the sole, which is the flat or rather concave surface; and the frog, an elastic pad placed on the back of the foot. The crust is the equivalent of our finger nail, and consists of a number of fibres running longitudinally from the coronet. This crust should never be rasped. To give a neater appearance to the shoe and to make the hoof fit it, the average blacksmith generally

runs his rasp over the crust, and in so doing destroys the strongest fibres, leading eventually to disease, inflammation, and other evils. A good blacksmith will make his shoe to fit the horse, and no workman should be tolerated who cannot do this.

In consequence of the protection afforded by the shoes, the crust will require to be pared down each month by removing with a knife the ground surface. The heels should be kept sufficiently low to allow of the frog touching the ground, as the frog is used by the horse in a state of nature to get a grip with, and obviate concussion and slipping. Nothing is worse than to see a horse raised up on his shoes, with a cavity between his frog and the ground.

The bars are provided by nature as a preventative (by acting as a stay) against contraction, and if left alone they answer their purpose very well. Blacksmiths are very fond, however, of cutting them out, with the result that horses so treated will suffer from contracted feet and corns. Most of the cases of bad corns and quittor can be traced to this cause, and the only way to effect a cure is to shoe the horse with tips, so as to cause again, by use and pressure, the development of the bars.

The sole, again, needs only to be left alone, and should on no account be pared or interfered with.

The frog, like the sole, exfoliates in flakes, and therefore also needs no paring. Curiously enough, without pressure and friction the frog will shrivel and almost cease to exist, and it can only be kept in a healthy state by allowing it to touch the ground, as mentioned above. If the frog is already in an unhealthy condition, and is the seat of thrush, it may be necessary to trim off ragged ends; but this should be no excuse for paring it down.

Horses should, as a rule, be shod once a month with new shoes. If their work is of a light nature and mostly slow, or on soft ground, it will not be necessary to renew the shoes more than once in six or eight weeks; but under these circumstances the shoes should be removed at the end of three or four weeks, in order that the crust may be pared and the shoe shaped before being reapplied. A better method still is to have new, thin shoes (as thin as is compatible with the amount of wear required) every month; but it is more costly than the former method. Tips require removing every fortnight; but in spite of this drawback their use is much to be recommended, as there is no doubt that the foot will be kept in a sounder, healthier

condition, and will grow much stronger than it will with ordinary shoes. No fear need be entertained that the frog or crust will wear out.

On the return of the horse from the smithy, observe (1) that there is no mark of rasp on the hoofs, and that they are not blacked or oiled to hide the signs of rasping; (2) that the sole has not been pared out; (3) that the frog has not been pared out unless it is unhealthy and ragged; (4) that the clinches have not been rasped after being turned down; (5) that the shoe does not project beyond the wall of the hoof; (6) that the bars have not been cut. Some blacksmiths make it a practice to run a little tar into the cleft of the frog: this plan is a good one where there is a tendency to thrush, and under any circumstances can do no harm.

CHAPTER IX

Cost of Keeping a Horse

As a number of people are deterred from keeping a horse because of their uncertainty of the expense to which such a luxury will put them; and as an equal number embark upon horse-keeping and eventually find, to their sorrow, that the expenditure is greater than they anticipated; as also a good deal of ignorance is constantly displayed (and consequently taken advantage of) about the fair and proper prices of stable accessories; a chapter devoted to prices may be useful to the novice, and may save him from having to learn these matters in the most expensive of schools, experience. The prices we give are, of course, only approximate. Prices vary in every part of the country, so that it is impossible to do more than suggest a fair average price for the best quality of article. If the prices paid by the reader are less than we name, he should be suspicious of the quality of the goods he is buying. It always pays to buy the best of everything; and it must be remembered that, as a rule, the best

costs more to produce than the inferior, therefore it is impossible to buy "best quality" at second best prices.

Stable Utensils

We will first see what amount of capital will need to be invested in the minimum number of stable utensils and appliances for one horse:

1 head collar,	$2.50
1 tie rope with spring hook,	.25
1 shovel,	.75
1 fork,	.75
1 broom,	.50
½ doz. dusters,	.50
1 hoof pick,	.25
1 currycomb,	.40
1 mane comb,	.35
2 pails,	1.50
1 corn measure,	.50
1 sieve,	.50
1 dandy brush,	.75
1 body brush,	1.50
1 4-bushel corn-bin,	4.00
	$15.00

To these may be added —

1 kersey horse-cloth,	$7.00
1 roller,	1.00
1 jute night-cloth with surcingle,	2 50
1 clipping machine,	2.00
Sundry brushes, metal polish, soaps, etc., for cleaning harness,	2.50
	$15.00

If two horses are kept, the above total of $30.00 must be augmented by another $10.00 for extras, blankets, etc. The great additional expense of artificially removing a horse's coat will at once be seen, and it is for the individual owner to make up his mind whether the amount of work his horse has to perform warrants this. Naturally, cloths for ponies will be slightly cheaper. Of course it is not necessary to use a kersey cloth, and the jute cloth can be made to serve the double purpose; but a change of clothing is healthier for the animal, so that the cloth not in use can get a daily airing. A slight saving in expense may be made by the purchase of a second-hand cloth. Such are always procurable at some of the dealers in any large city; but it may be remarked that the danger of the contraction of some skin or other disease from a second-hand cloth is a very real one, and it is strongly advised that the clothing should be subjected to thorough disinfection before being used.

Fodder and Litter

Good hay varies in price according to season, quality, neighborhood, demand, etc., but as a rule, under ordinary conditions the best quality cannot be bought for less than $20.00 per ton. As a

horse will consume not less than twelve pounds per diem, at this rate of consumption a ton of hay will last one horse about 170 days, or, roughly speaking, six months.

Oats will average from sixty to seventy cents per bushel. Taking the larger price as the one most likely to be paid for a good quality of grain, we shall find that with a consumption of ten pounds per diem a sack of one hundred and sixty pounds will last sixteen days, and as we must allow for an extra feed or two and for slight waste, we find that a fair allowance for a horse is two sacks per month. Bran we will leave out of the question, as if it is occasionally used the oats will be proportionately saved.

Straw will cost on an average twelve cents per bundle, and two bundles a week will be required to make a horse a good bed.

We therefore find that the annual cost of food and litter for one horse works out to a sum, roughly, of—

Hay, 2 tons, at $20.00 per ton, ...	$40.00
Oats, 100 bus. at 70c., ...	70.00
Straw, 104 bundles, at 12c. each, ...	12.50
	$122.50

or about $2.35 per week.

The lowest estimate of cost of keep of a small pony which consumes, say, about ten pounds of hay daily would be, roughly, seventy-five cents per week, and straw fifteen cents in addition, giving an annual total of $45.00 in round figures.

As the foregoing table proves, oats are the expensive item in the horse's menu, the daily reduction of every two and a half pounds (or quarter-peck measure) will mean an annual saving of $15.00 on the total bill.

To this sum has to be added the shoeing bill. Two and a half dollars is the usual price charged by good reliable blacksmiths and shoes should be renewed at least every month, making an annual cost of $30.00. Sometimes the shoes will not be worn out in a month and will only require removing, in which case there will be a saving in the shoe bill. The horse-owner must also allow an annual sum for replacing worn-out accessories, buying harness paste, mending harness, etc. Such incidental expenses as veterinary bills we do not take into consideration, because if the horse is fed on the best of food, is sensibly treated, and is carefully chosen in the first instance, it should remain healthy and sound for a great number of years. The total estimate for entire keep of one horse on

a generous scale amounts approximately to $150.00 per annum.

The keep of cart horses can be made to come to considerably less. As they are not required to do fast work, they will thrive on a mixed ration such as would be quite unsuitable for hunters and harness horses, and they can in consequence be kept for from $2.00 to $2.50 per week. The shoes of farm horses, instead of being steel, are often made of iron, and it is usual for farmers to contract with the village blacksmith to keep their horses shod for a fixed annual sum.

We have hitherto left out of consideration the fact that the horse-owner may be able to run his animals at night all through the summer in a paddock. The hay saved will probably be swallowed up in rent of land, so that the only profit will be the indirect one of increased health and longer working capacity of the horses. If the land is cheap its quality will be bad, and consequently a greater acreage will be required to run the horses on. We have also omitted to add groom's wages, and the prospective owner must not forget this item, nor the additional capital which has to be expended on horse, carriage, and harness, etc., when going into the matter of the cost of a turnout.

CHAPTER X

Hints on Breaking and Driving

THERE is a fascination for some people in the idea of buying or breeding young horses, breaking them in, and selling them when they have "grown into money." That they more often grow into some unsoundness has nothing to do with our present aspect of the case, and the true gambler in immature horse-flesh is not usually deterred from his speculative amusement by one or two pieces of what he calls "bad luck." It is obviously impossible, within the limits of the present handbook, to do more than touch upon the outlines of a matter which has been the subject of many volumes. Therefore a few hints on the most important points in connection with the breaking to harness and driving of horses, for the benefit of the amateur who has hitherto had little experience in these matters are all that it is possible to embody in the present article.

TACKLE

The indispensable equipment which is required

is a strong set of harness, a head-stall, a surcingle, and a large stock of patience. The quality of the last is probably the most important, because although horses of a certain disposition may be hurriedly broken in with success, yet the colt with pluck and spirit, which will eventually make the most pleasant harness horse, requires dealing deliberately with. Also, the more gradually each lesson is instilled, the more permanent will be the impression. Some people seem to think that by some wonderful and unexplainable hereditary process, a horse is born more or less broken in. Obviously, unbreakable and vicious animals have in course of ages been weeded out, and a naturally tractable stock hands on its nature to subsequent generations; but it is the disposition only which is passed on, nothing more tangible is acquired; and every colt has to be as carefully taught what is required of him in his service to man as his mother was before him.

Horses are by nature good tempered; some, however, are much more nervous and high spirited than others, and if roughly handled are extremely liable to resent bad treatment by a display of their powers of self-defense, which we call bad temper. These are the horses which try the

breaker's skill and patience, and are so often returned as spoilt from the hands of the professional. The breaker cannot spend too much time over the education of a nervous horse, and as such subjects are usually of good breeding and quality, the time spent will be well repaid later on when selling time comes.

Food

The first point to be taken into consideration is the feeding of the colt. Possibly more depends on this, particularly when breaking ponies, than might at first sight be supposed. A colt is not going to be worked, he is merely going to be broken in, and a diet which would be quite unfit for him under the first conditions will suit him admirably during his educational course. Corn should be absolutely withheld, and the diet restricted to hay *ad lib.*, or, preferably, grass picked up in a small paddock. The more sluggish the colt is at this time, in reason, the more quickly will he accept the new instruction and adapt himself to new conditions. Therefore it is perfectly legitimate, indeed it is of important assistance, to keep the colt in an obese and phlegmatic state by a grass dietary—which must not be confounded

with a low and weak condition, which is an entirely different thing, and not to be recommended, on account of the various troubles it may indirectly bring in its train.

Catching

If a colt will not come to hand in the paddock, he will have to be driven into a shed or stable and there captured. It will save time if he is accustomed to come to a quarter-peck measure with some corn in it. Then, if he is without a headstall, he can be captured with a halter in the following manner: Pull out the running nose-band, and slip it round the quarter-peck measure, keeping the head piece of the halter to the outer side of the measure. As the horse feeds with his nose in the measure, the nose-band can be almost imperceptibly slipped up the measure and round his nose, while the head piece is passed quietly over his ears.

When endeavoring to catch or drive in a horse, never run. If the animal breaks back, do not, by violent gesticulations, endeavor to stop him, or run and try to cut him off. If you run, so will the horse; and as he can run the fastest, he will get the best of it, and will, furthermore, enjoy the

excitement. Walk slowly after him, and gradually work him in the desired direction, and in the end you will get him to do what you want. It may take time, but not half so long as it will if he is upset and frightened or excited.

If a halter must be used to break in instead of a head-stall, do not forget to knot the slip rope, to prevent, as far as possible, squeezing and chafing the jaws.

Teaching to Lead

The next point is to teach the horse to lead. In this connection, and, indeed, throughout the preliminary handling, much more rapid and successful progress will be made if the breaker makes up his mind to work single-handed and to have no spectators. No animal is more suspicious than a young horse—suspicious of every object and every movement. Thus his whole time is spent in closely watching the actions of those around him, and this very peculiarity of his is of the greatest value to the horse-breaker. It is essential that he should follow every movement, and learn to connect each with its proper function in connection with himself, because only in this way does he assimilate and profit by the lessons taught him.

Now, if two or three persons are present, the colt gets confused with trying to keep an eye on all of them at once, gets terribly nervous, hardly realizes what is being done to him, and much valuable time and energy of both horse and breaker are wasted. This has been proved time after time. In the case of a terribly nervous and wild little hill pony brood mare of nine years old which was being broken, she could be caught, bridle, surcingle, and crupper affixed in about five minutes, alone; but the presence of an assistant rendered it impossible to do these things at all except by sheer force and after a prolonged struggle.

The first step in the actual breaking, then, is to affix the head-stall with a four-foot rope attached to its back dee, and by pulling the horse's head round to one side to upset his equilibrium and get him to move. Never stand in front of a horse and endeavor to drag him forward. For one thing, it is impossible to succeed in making him budge an inch by this means if he does not wish to, as he is perfectly stable in this position, and is heavier than his breaker. If you stand close to the shoulder, however, and pull or push the head round gently, the horse is bound to move a fore-

foot. Then he can be judiciously made to move again in a more or less circular direction, until he suddenly seems to understand what is wanted, and leads freely.

Mouthing

The next lesson is to mouth the colt with a bit affixed to the side dees of the head-stall. Here a surcingle, and the crupper off the set of harness, will be required, and a rope or rein passed from the bit through the back loop of the crupper, which is kept in place by the surcingle. It may incidentally be mentioned that a horse cannot kick the operator when putting on the crupper if the latter is careful to stand just behind the shoulder and close to the horse, remembering to keep the animal's head pulled round slightly toward him.

The horse should be reined up just sufficiently tightly for the head to be held in its best natural position. The object is to connect in the mind of the animal the fact of the bit being placed in the mouth necessitating the best natural carriage of the head. If the horse has a badly-formed neck, however, no amount of reining-up can permanently improve it.

Great care should be taken not to rein up so

tightly as to cause the corners of the mouth to become sore, as is so often done. Their sensitiveness, upon which the future "mouth" so much depends, is impaired if they have been cut and raw at this stage of breaking. Having got thus far, be content to lead the horse about (by a rope attached to the back dee of the head-stall, and not attached to the bit or side dees) for some days, taking him into traffic, introducing him to persons and motor cars, and otherwise endeavoring to accustom him to the many things he will have to be intimately acquainted with before his education is complete. Lead alternately from the off as well as the near side, as, if every operation is performed from the near side, it will be found one day, when urgent necessity compels an off-side approach, that the horse resents that to which he has not been accustomed. Also, it may be hardly necessary to mention, when leading from the near side, keep to the right side of the road when passing vehicles, and *vice versa*, as only thus can a horse be controlled and prevented from suddenly turning his quarters across the roadway.

Teaching to Guide

Difficult horses, or ones which are to be very

highly educated, should next go through a course of long rein driving to mouth and supple them. This consists essentially in driving them round and round in a large circle by means of a pair of long reins (two pairs of driving reins will do) attached to the bit. One rein passes over the back or round the quarters of the horse, and the other passes direct from mouth to hand, the superfluous rein being gathered up in loops ready to let out as required. The horse must be taught to circle in either direction, to turn about in the figure 8, and perform either at the walk, trot, or canter. As success depends almost as much upon the skill of the operator as upon the tractability of the horse, and as a paddock or large yard is necessary for the evolutions, we will not dwell on the system, excellent though it is, but will refer the reader to special works which treat of the matter in detail. The whole system is far superior to lunging with one rein only, which has not the same effect, and which must not be confused with long rein driving. (See Fig. 28.)

The breaker has now reached the stage when he has to teach the horse to understand and obey certain signals given with the rein. A good mouth, as understood by drivers, may be ana-

lyzed as the promptness, accuracy, and precision with which the animal obeys the signals given him. This, again, depends partly upon the sensitiveness of his mouth, and partly upon the way in which he is taught the meaning of certain signs. Now, no one is more helpless than the man who is walking behind a horse and driving it in front of him with reins. If the smallest pony chooses to

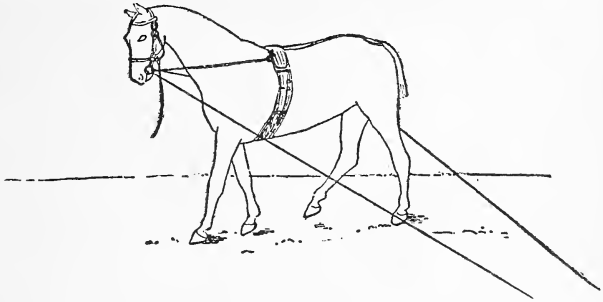

FIG. 28.

Showing Horse bitted up ready to lead; also showing Position of Reins in Long Rein Driving.

bolt under these circumstances, it can hardly be prevented, and the driver usually ends by ignominiously letting go the reins and sitting down rather suddenly in the road. Having harnessed the horse fully, except, perhaps, for the hames and traces, and having passed the breeching straps

through the tugs and strapped them, and fastened up the belly-band, put on two reins, one fastened to each side of the bit, being careful to leave the ends which pass to the hands separate. There are several reasons for this. First of all, the longer the reins, the greater the control of the man over the horse; secondly, if things do not go smoothly, the horse can be pulled round by one rein and stopped; thirdly, the danger of the man getting tripped up in the loop of the rein is done away with.

Some instinct of the horse leads it naturally to pull against the indication of the rein. Thus, if the left rein is pulled, the untrained horse always endeavors to bear to the right, and *vice versa*. To counteract this, a slight, sharp flick with a long whip must be given to the left side of the animal when the right rein is pulled, and so on, the pull and flick being simultaneous, and graduated to the degree of turn required. It is wonderful how quickly the colt learns to obey the indication of the rein alone, its promptness being in exact ratio to the precision with which the double indication is given in the first instance. Once the horse has learned the meaning of the various pulls on its mouth—left rein, turn to the left; both reins,

stop (this always accompanied by a decided verbal "whoa!"); "click!" go on, etc.—he is fit to put into the shafts, provided he has got used to blinkers, in which he is sure to be a little strange at first.

Putting Into a Cart

Bad starting, than which no more tiresome trick exists, is usually caused by (*a*) putting a horse into too heavy a cart at first; (*b*) starting it up-hill; (*c*) or driving it with tender shoulders. A very light, empty cart should be used, and not a heavy one loaded up with men, on the supposition that the heavier it is the less possibility will there be of the colt running away with it!

An assistant will be required to hold the shafts up over the horse's back and to help to harness him. Everything should be done without fuss, quietly and expeditiously, as the whole future behavior of the animal depends upon the first impression it gets of harness work. A head-stall or halter should be left on under the bridle to lead by, and a rope should be tied across the loins as a preventative of possible kicking.

When everything is ready lead the colt off quietly, a person on each side of its head to pre-

vent accidents. In most cases, if the preliminary lessons have been well instilled, the colt will go off well and quietly. For two or three days his work should be confined to a few miles out and back along all classes and gradients of roads, making a "round" whenever possible. At length, if all goes well, the breaker should get into the cart and drive the colt, the attendant still leading from one side. In a day or two both may ride, and the pace may be increased and the journeys lengthened.

Sore Shoulders

A light cart, short journeys, and as small an amount of exertion as possible for the colt have been insisted on because only thus can that bane of horse-breakers, sore shoulders, be avoided. The soreness of course starts as a bruise, which quickly works into a sore place, and will necessitate a total stoppage of breaking operations at a time when it is most important that the work should be regularly carried on; and it may, in addition, lead the colt to acquire the habit of starting badly or awkwardly. Thus, at all costs, must these catastrophes be avoided. If the animal is confined at first to pulling a very light, empty cart, and is

not made to sweat excessively, the shoulders will gradually harden of themselves, without any disorganization ensuing. Of course we are assuming that the colt is provided with a properly-fitting collar. A straw collar is better than a leather one at this stage, and if a breast collar is used on alternate days, bruised shoulders may be avoided. In any case, if the neck becomes in the slightest degree bruised, stop all shaft work at once until it is perfectly well again. Also, daily from the commencement of breaking-in to harness, bathe the neck under the collar immediately on the return from work, with a saturated solution of alum and water, which will help to harden the skin.

Tricks

It must be borne in mind throughout the breaking that it is a comparatively simple matter to prevent a horse doing that which he should not do, but that if he is once allowed to develop a trick or vice it may take months of trouble and hard work to make him forget it again.

Shoeing

A visit to the blacksmith is, of course, part of the necessary education of every horse, and is very

often actually the first point attended to by the amateur horse-breaker. We do not hold with this early shoeing, and consider that, for a variety of reasons, the business is best deferred until the colt is so far broken as to be fit to drive regularly. Leaving out of the question the undue fright experienced by an almost unhandled animal, and the horror and dislike with which in consequence it may, in future, associate a visit to the blacksmith, a young horse is much more likely to injure himself, or do harm of some sort, if he is shod. Furthermore, if the breaking process is unduly prolonged owing to galled shoulders, the animal will be as well without shoes during his enforced idleness. The feet must, of course, be trimmed up, and the edges of the hoofs rasped to prevent a tearing out of ragged edges, and if this is attended to, the horse will be able to do quite a lot of work on dry roads without further attention.

The dampness of our climate is one of the chief causes which make it impossible for a horse to do all his work unshod. Water softens horn, and causes it to become much too weak to stand friction; but in the case of a colt the work it does (or should do) during breaking is not of a sufficiently arduous nature to be likely to do harm to the feet,

provided, of course, that the animal has naturally hard and well-shaped feet to start with—a condition we are taking for granted.

Driving

The breaking-in of a colt has been treated entirely from the single harness point of view, because a horse which will go alone will always work in double harness, although the reverse is not always the case. Once broken, a horse has to be mannered and taught the thousand and one little items, insignificant enough in themselves, which, in the aggregate, help to raise his value to that of a high-class and expensive animal. Many people confuse quietness with sluggishness. A quiet horse should be full of spirit, free and fast, but he should have been so perfectly mannered that he never "plays up," or shows the exuberance of his spirits in an unorthodox manner, but is absolutely free from tricks, vice, or peculiarities. All this is taught by the exercise of great patience and attention to detail when driving the colt after the rough breaking-in is completed. First of all, teach the horse never to fidget or move off until the signal—a combined "click" and tightening of the rein—is given. Teach him

to stand well and alertly, and not to rest his legs or go to sleep. Teach him to stop dead at a decided "Whoa!" without any additional signal with the reins, as this habit may prove most useful in an emergency and always give him his signal in a firm, decided voice.

In driving, always go slowly off the top of a hill, and at the summit pull the horse well back into the breeching, so as to get his weight off the forehand. If the animal is thoroughly steadied like this, and his head is kept up with a tight rein, he can trot down almost any hill with a good surface in safety. Horses most frequently fall on a slight hill down which they are being driven with a slack rein. If their weight had been taken off the forehand, a false step would not have resulted in anything worse than a slight stumble. Therefore the driver must be "driving" all the time, and must not allow himself or his steed to be lulled into a false sense of security.

It is difficult to define the exact tension at which the reins should be held. It should vary with the gradient of the road and other factors; at the same time, of the two extremes, a tight rein is much safer than a loose one, for with it

the horse is always under control in the case of a sudden shy or stumble. With a loose rein he may fall, or shy right across the road, before the rein can be brought to a tension sufficient to steady him.

Never whip or flick a horse going down-hill if it can possibly be avoided, and never use the whip unless the reins are held tightly. One of the worst errors the amateur driver falls into is an inability to keep the whip still. This is, of course, fatal to the freeness of a colt; and we have known many old horses turned into inveterate plugs in their old age solely through this fault on the part of their driver. If a horse is being continually flicked and touched with the whip-lash, he will, in a remarkably short time, have become so familiarized with it that he will fail to respond. If the whip must be used to correct some fault or to stimulate, it should be used sharply and decisively—in other words, it should not be used at all unless it is absolutely necessary. He will thus always have a wholesome fear of the weapon, and will never develop into a plug. A sluggish horse may often be cured by a few thorough beatings, which show him that his driver intends to put up with no nonsense. Therefore, if a driver cannot

resist flicking his horse's back with the whip in and out of season, then the whip must be kept in its socket, so that he may not be tempted to make improper use of it.

As a rule, it is not advisable to whip a horse for shying. If he is really frightened the punishment will only increase his fright; if he shies from high spirits, such bad manners must be suitably punished only if it is impossible to ignore them altogether.

In these days of motor cars and other road nuisances, it is especially necessary that only competent and experienced drivers should be allowed on the roads. Very often a horse shies at some object solely because of the nervousness of his driver. By instinctively tightening the reins, and settling himself in his seat, the driver conveys to the horse that something is about to happen. The animal becomes agitated and nervous by the unusual signs conveyed by the reins, looks about expectantly for the supposed danger, and shies or otherwise displays his alarm at some object which, had the driver not given him the office, he would probably have taken no notice of.

Always put on the brake gradually, and in a degree to correspond with the steepness of the

gradient. Some people put it on hard at any and every hill, whereas it is more restful for a horse in a light vehicle to hold back down slight inclines. In any case, the brake power should be applied notch by notch as the declivity increases, and should be taken off gradually in the same way as the bottom is approached.

CHAPTER XI

Common Ailments

A SHORT chapter will be of value on those minor ailments of which every horse-owner is likely sooner or later to have experience, but the more obscure or serious diseases will be left to the attention of the veterinary surgeon. The remedies given are as simple as possible, as elaborate concoctions are often neither procurable at short notice in an emergency nor of any particular advantage to any one but the druggist.

It may be mentioned that the commonest causes of diseases of the bowels and urinary organs are bad food and water, hence in such cases an entire change of forage will probably be necessary. Diseases of the chest (coughs, colds, etc.) are most frequently due to bad ventilation, exposure, neglect; diseases of the skin to bad grooming, bad forage, or barley straw; diseases of the feet to bad shoeing and neglect; and thrush, cracked heels, and grease to neglect and bad management.

Abscess

An abscess or swelling on the face should always awake suspicion of a decayed tooth, and if on examination such proves to be the case, removal of the tooth is the only remedy.

Catarrh

Acute inflammation of the mucous membrane of the nose and air-passages.

Symptoms.—Loss of appetite, staring coat, watery discharge from the nostrils, followed by swollen glands under throat, and perhaps sore throat.

Causes.—Atmospheric changes, such as when first bringing a young horse into the stable; neglect; bad management.

Treatment.—Removal to a cool box; plenty of clothing; flannel bandages; carrots or green food, and warm mashes (laxative diet). This disease, if taken in time, will not develop seriously, and no medicine is required. If, however, it is neglected at first, and the patient in a few days is worse instead of better, a veterinary surgeon must be called in, as there is always danger of complications, such as bronchitis, pneumonia, etc.

Cracked Heels

Chaps of the skin: when neglected, run into Grease.

Symptoms.—Itching of the heels; offensive discharge from the skin; tender cracks; general swelling of the legs; sometimes lameness on first going out.

Causes.—Neglect and bad management leading to deranged secretion of the skin in the hollow of the heel. Though often due to debility, may also arise from fatness and insufficient exercise. Clipping the hair off back part of the legs is another frequent cause. Low-bred horses, by reason of their weaker circulation, are more prone to this disease than high-bred animals, and it is frequently present in cart horses which are walked through water to clean their legs before going into the stable.

Treatment.—The most important treatment is to cease wetting the legs. In slight cases this alone will effect a cure. In severer cases the heels must be washed daily with water containing disinfectant to remove all dirt from the cracks, and then, after being thoroughly dried, they should be dressed with carbolic ointment. A narrow bandage round the pastern will afford protec-

tion from dirt and cold until the cracks are healed.

Colic or Gripes

Spasm of the muscular coat of any portion of the intestines.

Symptoms.—Apparent internal pain; the horse looks round to his flanks; scrapes with forefeet; walks round box; lies down and rolls, or lies down and gets up again; belly frequently tense and swollen. When the attack is going off, the interval of time between the spasms becomes longer.

Cause.—Indigestion in some form.

Treatment.—The horse must be led about. Friction over the abdomen will also give relief. The patient must be prevented from throwing himself down. If alternate friction and walking exercise do not alleviate, a dose of a drachm and a half of camphor and an ounce of nitric ether mixed with twelve ounces of water will probably give relief. If at the end of, say, six hours the horse is no better, skilled aid must be resorted to.

Corns

Injury produced by pressure to the angle between the crust and the bars.

Symptoms.—A reddened appearance in the angle

of the sole, and lameness. The horse will often start lame, and go perfectly sound after a mile or two, and by this symptom may a corn be recognized from other diseases of the foot.

Causes.—Bad shoeing, and particularly the cutting away of the bars and the paring out of the seat of corn, whereby dirt accumulates in the hollow so made and causes injury. There is also a predisposition to corns in flat feet and feet with wired-in heels, because undue pressure is liable to come on the seat of corn.

Treatment.—If the cause—pressure—is removed, the corn will be cured. A three-quarter shoe will do this as a rule. Continual paring out will only effect a temporary cure if the pressure is not also removed. Some horses suffer from corns only in the winter when in the stable, and become perfectly sound immediately they spend a portion of their time at grass. In such cases, the dryness of the feet when in the stable seems to be in part the cause. In any case, the most important factor in the prevention of corns is never to allow the blacksmith to pare out the seat of corn.

Lampas

Congestion of the blood-vessels of the palate.

Symptoms.—Loss of appetite, and, on examination, a swelled condition of the roof of the mouth.

Causes.—In young horses, teething. In old horses, very often irregularity of the molar teeth, bit injuries, or indigestion.

Treatment.—If the molars are at fault, the irregularity may be removed by a rasp. The diet must consist of wet bran and soft food for a day or two, until the inflammation subsides and the mouth is no longer tender. The cruel practice of burning the palate with a hot iron, which was in old days considered the recognized cure, is as useless as it is brutal, and is never now done.

Mange

Due to a parasitical insect which burrows into the skin.

Symptoms.—Minute pustules usually commencing on the withers or croup, which burst and coalesce and form patches of encrustation on the skin. The hair falls out, and the skin becomes harsh and sore if the horse rubs himself to relieve the intolerable itching.

Causes.—Bad food, by lowering an animal's condition, may predispose it to "catch" mange, but if it is well groomed, the parasites cannot get

a foothold. Mange is due, therefore, to neglect and nothing else, and its appearance in a stable should suggest the instant dismissal of the responsible servant. A well-groomed, badly-fed horse will not develop mange; neither will a well-fed, ungroomed animal.

Treatment.—This consists of killing the parasites. The skin should be well washed with soft soap and water, and, after being carefully dried, should be dressed with a mixture of one part petroleum and six parts of oil, or with some sheep dip, or with, in fact, almost any germicide, applied with a soft brush. Every day the spots should be washed and redressed. A change of diet is beneficial, and green food desirable. All clothing worn by the horse should be thoroughly baked or boiled before being used again, and the stables should be whitewashed, as the ailment is highly contagious.

Sore Back and Galls

Causes.—Badly fitting saddle or collar, or awkward rider. If a horse is ridden or driven when out of condition, or put to a long day's hunting when unused to carrying a saddle, he

may become tender, and if used again before the bruise is healed, will become sore.

Treatment.—Entire cessation of work. The saddle or collar should be left on a colt for a time when he comes in hot from work. If the skin beneath is bruised, swelled, and tender, the place may be bathed with a strong solution of salt or alum and water, which will help to harden the skin. The only treatment for an advanced case is rest, as, if the owner continues to use the horse, the sore which will develop will take weeks to cure instead of only a few days. In any case, the padding of the saddle should be altered so as to shift the pressure. If a colt becomes tender during breaking, and it is undesirable to temporarily discontinue his education, a breast collar may be used for a few days.

Grass-fed horses sometimes become girth-galled when first put into work. A handful of flour thrown on the sore immediately it is noticed will prevent it giving much trouble.

Thrush

An unhealthy secretion issuing from the cleft of the frog, and one of the commonest diseases of horses.

Causes.—Bad stable management and neglect; dirty stable floor; feet not picked out; also occasionally due to paring of the feet or high-heeled shoes, so that the work and pressure necessary to maintain the frog in health is not obtained.

Treatment.—In trivial cases, when the horse is to be kept in work, some Stockholm tar run into the cleft once a week will prove beneficial. In severe cases, after the part has been cleansed, a piece of tow saturated with a lotion composed of a mixture of one part carbolic acid to twenty parts of water thrust into the cleft, and renewed night and morning for some days, will prove effectual. In chronic thrush it may be necessary to shoe the horse with tips, as, if the disease has not gone too far, the wear and pressure will probably cause the foot to again become sound and strong.

Wounds

All flesh wounds should be carefully cleansed with warm water to remove all particles of dirt, etc., and should be dressed with carbolic ointment or lotion. The same treatment applies to broken knees, and, in addition, a fold of lint kept con-

stantly wet with a lotion composed of one part carbolic acid to twenty of cold water will be beneficial during the first few days. The most important matter in the treatment of all wounds is disinfection.

THE END

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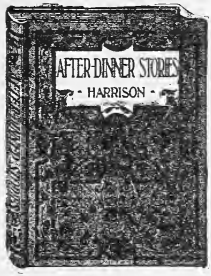

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